

Biological Apparatus and Supplies



Catalog N
1911

CENTRAL SCIENTIFIC COMPANY

412 to 420 Orleans Street CHICAGO, U. S. A.

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CENTRAL SCIENTIFIC COMPANY.

Biological Apparatus and Supplies

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1911

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Central Scientific Company

412 to 420 Orleans Street : : CHICAGO, U. S. A.

NOTICE



WE desire to advise our friends and patrons that we are agents for the celebrated Spencer Microscopes, manufactured by the Spencer Lens Co., and carry a complete stock of all Microscopes listed herein. The Spencer Microscopes are of recent design and contain many important features not possessed by any other microscope in the world. The Spencer lenses are guaranteed against all defects. We will be glad to send any one of the Spencer Microscopes to responsible persons for comparison, grade for grade, with any objective or stand of American or European manufacture, with the utmost confidence that the Spencer will be found to be unsurpassed by any and only equaled by few. We unhesitatingly recommend the Spencer Microscopes as representing better values than any other instrument on the market.

Central Scientific Co.

TERMS OF SALE.

DISCOUNT. 10% from all prices in this catalog except where marked **net** or **duty free**.

When ordering, kindly use our catalogue numbers when possible. Give Shipping Directions, as it often facilitates delivery.

Remittances should be made by draft on New York or Chicago, Postal or Express Money Order. We have to pay Exchange on all checks and cannot bank School Orders or Warrants at their face value.

Terms, unless otherwise agreed upon, are **30 days net**. No cash discount given. We issue the following Catalogues and Pamphlets, which we shall be pleased to mail, post free, to those interested.

- M,** Physical and Chemical Apparatus.
- M & G,** Apparatus for Millikan & Gale.
- N,** Biological Apparatus.
- O,** Hartl Optical Disc and Accessories.
- P,** Physiographical Apparatus.
- Q,** Lantern Slides.
- R,** Chemicals and Reagents.
- X,** Agricultural Apparatus.

C
"N", 1911

COMPOUND MICROSCOPES.

In our selected series of Spencer microscopes each one is constructed to serve an especial purpose in some particular class of work, and our aim has been in each case to adopt forms of construction which shall best accomplish that purpose, with due consideration to stability, completeness, simplicity, and general adaptability and at the same time to afford our friends an opportunity to satisfy individual preference by providing a choice of types of instruments which will satisfy each particular need. In this respect we offer for advanced laboratory work No. 36 and No. 40, which are of identically the same construction except the fine adjustment and style of arm. The same may be said of No. 66 and No. 70 for elementary laboratory work.

The arm is the natural place to grasp a microscope. In the past, pupils have been taught to grasp it by the pillar, which is unhandy and unnatural, and except under rigid supervision, is seldom employed. All of our microscopes of the various types of arm are provided with means for handling without injury to the delicate threads of the fine adjustment. Nos. 36 and 66 have handles in the arm, which are very convenient and have proved very popular. Nos. 40 and 70 instead have handles beneath the arm and independent of it. This is a patented feature and is used on no other make of microscopes.

Nos. 36 and 66 are provided with the lever fine adjustment which has proved a perfect success and has certainly come to stay. Nos. 40 and 70 have the Continental type of fine adjustment. No. 65 is a new microscope with still another type of handle and with the lever fine adjustment. We believe it will be very heartily received, especially by those who desire a very high grade microscope at a very moderate cost. We predict for it great success. The Handle-arm type (No. 36 and No. 66) is usually preferred to the Continental type, although both are perfectly satisfactory. In the selection of microscopes, therefore, it will be seen that we have provided considerable scope for the exercise of individual taste.

Microscopes Nos. 36, 40, 66 and 70 are regularly supplied with stages which are 95mm. wide and which are of sufficient size to answer the demands of general laboratory work and are usually preferred to stages that are wider. If wider stages are preferred, we are prepared to furnish any of these microscopes on special order with a stage 112mm. wide and at the same price; however, for general laboratory purposes we do not recommend it. The microscope stands are made under the direction of scientific men of many years of practical laboratory experience, as well as manufacturing experience. You will thus find that the Spencer microscopes are designed more from the laboratory worker's standpoint than purely that of the manufacturer. For general adaptability for laboratory purposes, to stand the rough and tumble of laboratory use, and for features that make for convenience, comfort and durability, they stand alone.

All Parts Are Interchangeable.

The Mirrors Are of Large Size.

Objectives Are Corrected for Tube Length of 160mm.

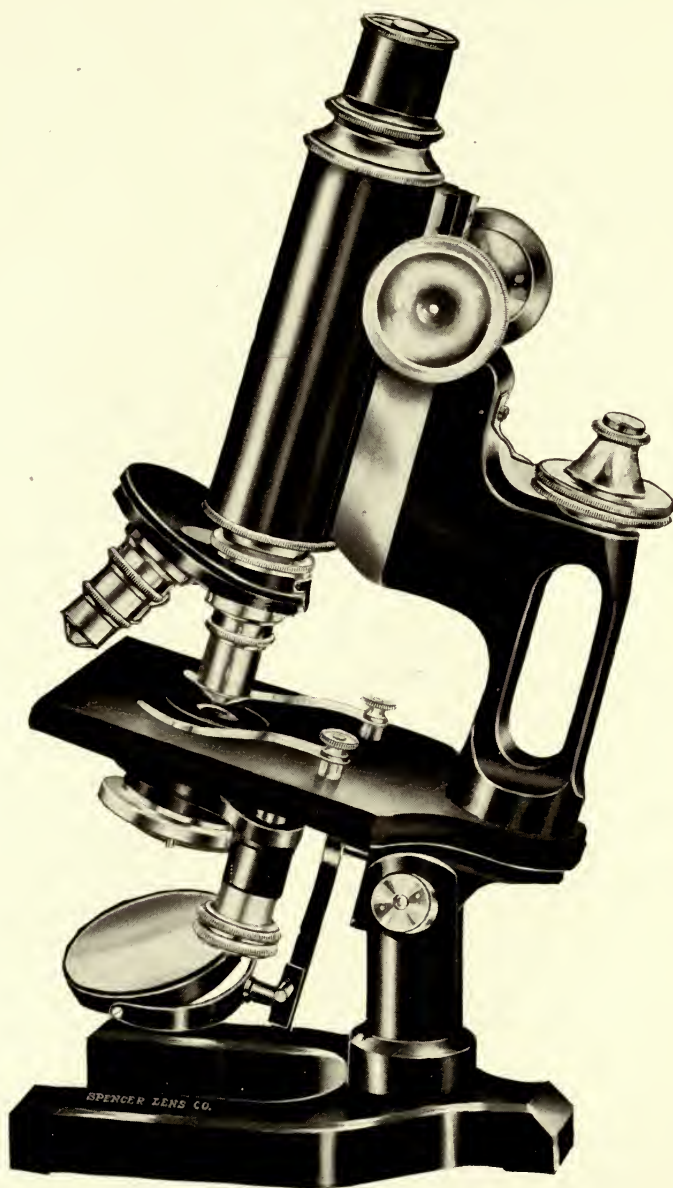
All Nosepieces Are Dust Proof, with a Decided Stop for Optical Centers.

All Objectives and Nosepieces Are Made with Society Screw.

Fine Adjustment Heads Cannot Be Removed.

All Optical Parts Are of Superior Quality and of Great Uniformity.

They Are Made to Use and to Last.



No. 36H.

SPENCER MICROSCOPE.

NO. 36 SPENCER MICROSCOPE.

On account of its completeness and general adaptability for advanced laboratory work, this instrument has become one of the most popular of microscopes. We recommend it for the individual use of the professor or teacher, for the physician or the research student. It is equipped with the Spencer standard quick-screw sub-stage with friction collar for the condenser, circular dust proof nosepiece, upper and lower iris diaphragms, tube, rack and pinion, joint for inclination, mirror and optical parts. It has a very large stage, long distance from optical axis to base of arm, graduated micrometer screw with indicator, adjustable mirror bar; stage is covered, top and edges as well, with genuine vulcanite rubber, vulcanized directly to the brass stage and is provided with handle in arm for convenience in carrying and for protection to the threads of the fine adjustment. The fine adjustment is extremely sensitive and delicate.

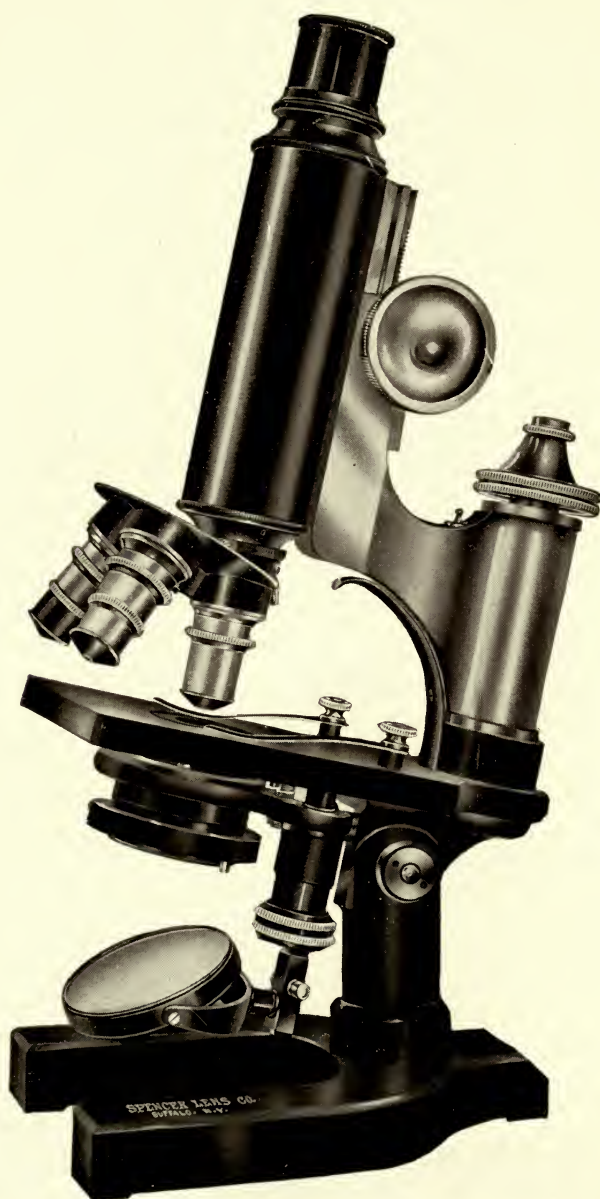
SPECIAL FEATURES.

- I. Size of stage, 95mm. wide, 108mm. deep. (112mm. width may be substituted.)
- II. Distance from optical axis to base of arm, 68mm.
- III. Genuine vulcanite rubber covers the whole of the top of the brass stage and edges as well.
- IV. Body tube, in fact, nearly the whole microscope, is finished with our black alcohol-proof lacquer, thus avoiding reflection of light into the eyes and affording greater durability.
- V. Fine adjustment bearings automatically lubricated and protected from dust.
- VI. Compact construction, affording great ease in using.
- VII. Fine adjustment ceases to work when objective is in contact with the cover glass.
- VIII. Handle arm for convenience in carrying and for protection to fine adjustment.

Prices include a mahogany cabinet.

| | | |
|------|---|----------|
| 36A. | Microscope, with one eyepiece, 16mm. and 4mm. objectives, single nosepiece | \$ 41.50 |
| 36B. | Microscope, same as above, with double nosepiece..... | 45.50 |
| 36C. | Microscope, same as 36A, with two eyepieces..... | 43.00 |
| 36D. | Microscope, same as 36B, with two eyepieces..... | 47.00 |
| 36E. | Microscope, same as 36B, with Abbe Condenser (N. A. 1.20).... | 53.00 |
| 36F. | Microscope, same as 36D, with Abbe Condenser (N. A. 1.20).... | 54.50 |
| 36H. | Microscope, same as 36F, with 1.8mm. oil immersion objective and with triple nosepiece..... | 80.00 |

For drop swing condenser mounting add \$5.00.



No. 40H.
SPENCER MICROSCOPE.

NO. 40 SPENCER MICROSCOPE.

This microscope for many years has been a standard for advanced laboratory work. Its large stage, long arm, compact construction and general adaptability for research work has left nothing to be desired. It is identical in construction with No. 36, except the arm and fine adjustment. No. 36 is the Handle-arm type carrying the lever fine adjustment. No. 40 is the Continental type of arm and fine adjustment. Immediately beneath the arm, independent of it and following the curve of its lower edge, is a neat unobtrusive handle (Spencer Patent) which provides a means for carrying the instrument without injury to the fine adjustment. It embodies all the special features mentioned in description of No. 36. The fine adjustment is very delicate. The indicator for the graduated head of micrometer screw can be pushed down into the arm entirely out of the way. It is equipped with the Spencer standard quick-screw sub-stage with friction collar for the condenser, circular dust-proof nosepiece, upper and lower iris diaphragms, tube, rack and pinion, joint for inclination, mirror and optical parts.

SPECIAL FEATURES.

- I. Large stage, 95mm. wide, 108mm. deep. (112mm. wide may be substituted.)
- II. Long arm 67mm. from optical axis.
- III. Genuine vulcanite covered stage.
- IV. Black alcohol proof finish.
- V. Compact construction.
- VI. Automatically lubricated fine adjustment bearings.
- VII. Fine adjustment ceases to work when the objective strikes the cover glass.
- VIII. Handle beneath the arm for convenience and protection.

Prices include a mahogany cabinet.

| | | |
|------|---|----------|
| 40A. | Microscope, with one eyepiece, 16mm. and 4mm. objectives, single nosepiece | \$ 41.50 |
| 40B. | Microscope, same as above, with double nosepiece..... | 45.50 |
| 40C. | Microscope, same as 40A, with two eyepieces..... | 43.00 |
| 40D. | Microscope, same as 40B, with two eyepieces..... | 47.00 |
| 40E. | Microscope, same as 40B, with Abbe Condenser (N. A. 1.20).... | 53.00 |
| 40F. | Microscope, same as 40D, with Abbe Condenser (N. A. 1.20).... | 54.50 |
| 40H. | Microscope, same as 40F, with 1.8mm. oil immersion objective and with triple nosepiece..... | 80.00 |

For drop swing condenser mounting add \$5.00.



No. 65B.

SPENCER MICROSCOPE.

NO. 65 SPENCER MICROSCOPE, NEW.

To satisfy the demands for a larger microscope for elementary work, without entailing too great an increase of cost, this new microscope is offered. It is the largest microscope, embodies the most workable features, and we believe is the best microscope that has ever been offered for anything like a similar price. It is provided with a larger stage and a greater distance from the optical axis to the base of the arm than has previously been attempted in a similarly priced instrument. This large stage, with a long arm giving a distance of 75mm. from optical axis to the base of the arm, we believe will appeal to every laboratory worker, especially those who are working with petri dishes, large slides or dishes of living material. It is provided with a new type of handle arm for convenience in carrying and affords protection to the delicate threads of the fine adjustment.

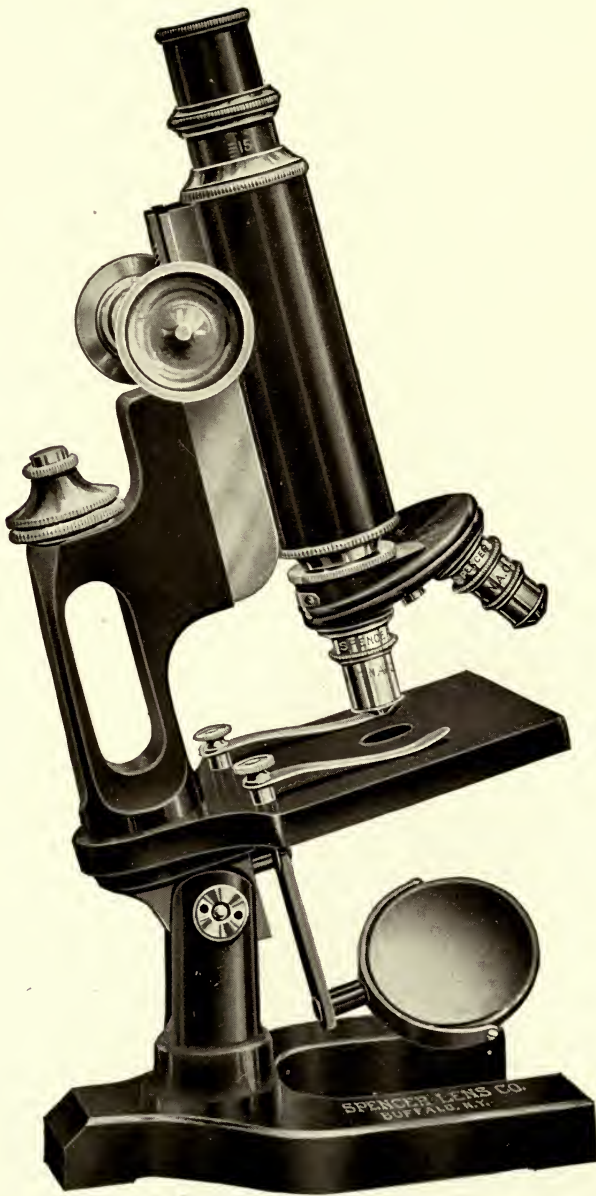
SPECIAL FEATURES.

- I. Size of stage 112mm. wide, 108mm. deep.
- II. Distance from optical axis to base of arm 75mm.
- III. Genuine vulcanite covers the whole of the top of the brass stage and edges as well, it being vulcanized directly to the brass.
- IV. The body tube, in fact, nearly the whole microscope, is finished with a black alcohol-proof lacquer, thus avoiding the reflection of light into the eyes.
- V. Greater ease in using due to compact construction.
- VI. Iris diaphragm nearly flush with the upper surface of the stage and is operated by a knurled ring which can be reached from any side, instead of a knob which is always difficult to find.
- VII. Fine adjustment bearings automatically lubricated and protected from dust.
- VIII. Fine adjustment ceases to work when objective is in contact with the cover glass.
- IX. Handle arm for convenience in carrying.

It is equipped with our standard tube, circular dust-proof nosepiece, rack and pinion, joint for inclination, mirror and optical parts the same as used on our higher priced instruments.

Prices include a hardwood cabinet.

| | | |
|------|--|----------|
| 65A. | Microscope, with one eyepiece, 16mm. and 4mm. objectives, single nosepiece | \$ 27.50 |
| 65B. | Microscope, same as above, with double nosepiece..... | 31.50 |
| 65C. | Microscope, same as 65A, with two eyepieces..... | 29.00 |
| 65D. | Microscope, same as 65C, with double nosepiece..... | 33.00 |
| 65E. | Microscope, same as 65B, with Abbe Condenser (N. A. 1.20).... | 37.00 |
| 65F. | Microscope, same as 65E, with two eyepieces..... | 38.50 |
| 65H. | Microscope, same as 65F, with triple nosepiece, oil immersion 1.8mm. objective | 65.00 |



No. 66B.

SPENCER MICROSCOPE.

NO. 66 SPENCER MICROSCOPE.

This microscope, with a very large stage, and with a handle arm for convenience in carrying as well as a protection to the fine adjustment threads, was placed on the market some five years ago to meet a very evident demand for an instrument embodying such features. That it has satisfied this demand and proved a great success is shown by the fact that it has found its way to nearly every university, college, academy and large high school, as well as hundreds of smaller ones, of the country. We doubt whether any microscope has ever been marketed which from the very first has met with so hearty approval and has given such general satisfaction. Within the past two years this microscope has been completely rebuilt, enlarged and improved. As it is made now, for general adaptability for elementary laboratory purposes, at the price for which we sell it, it has no equal.

SPECIAL FEATURES.

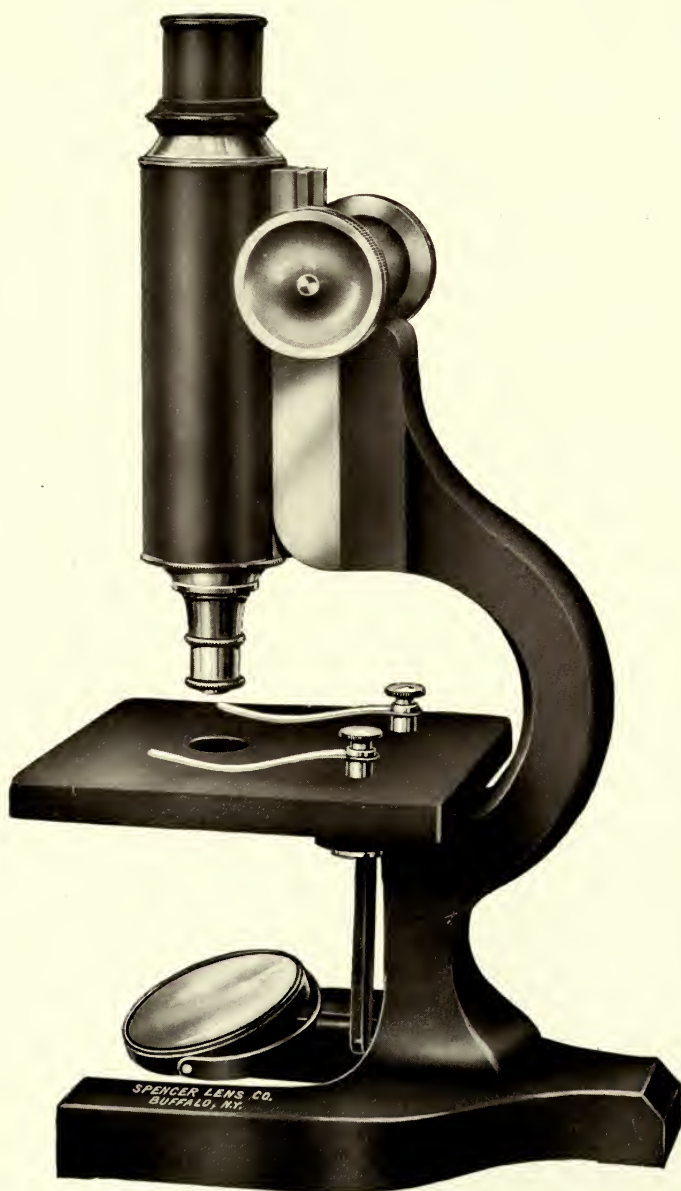
- I. Size of stage, 95mm. wide, 44mm. deep.
- II. Distance from optical axis to base of arm, 55mm.
- III. Genuine vulcanite covers the whole of the top of the brass stage and edges as well, it being vulcanized directly to the brass.
- IV. Nearly the whole microscope, including body tube, is finished with a black alcohol-proof lacquer, thus avoiding reflection of light into the eyes.
- V. Its construction is very compact, being made lower than usual to afford greater ease in using.
- VI. Fine adjustment bearings automatically lubricated and protected from dust.
- VII. Fine adjustment ceases to work when objective is in contact with the cover glass.
- VIII. Handle arm for convenience and protection in handling.
- IX. Iris diaphragm nearly flush with the upper surface of the stage and operated by a knurled ring which can be reached from any side.

It is equipped with our standard tube, circular dust proof nosepiece, rack and pinion, joint for inclination, mirror and optical parts.

Prices include a hardwood cabinet.

| | | |
|------|---|----------|
| 66A. | Microscope, with one eyepiece, 16mm. and 4mm. objectives, single nosepiece | \$ 27.50 |
| 66B. | Microscope, same as above, with double nosepiece..... | 31.50 |
| 66C. | Microscope, same as 66A, with two eyepieces, single nosepiece.... | 29.00 |
| 66D. | Microscope, same as 66C, with double nosepiece..... | 33.00 |
| 66E. | Microscope, same as 66B, with Abbe Condenser (N. A. 1.20).... | 37.00 |
| 66F. | Microscope, same as 66E, with two eyepieces..... | 38.50 |
| 66H. | Microscope, same as 66F, with triple nosepiece, oil immersion 1.8mm objective | 65.00 |

Pages 12 and 13 omitted—obsolete.



No. 74A.

SPENCER MICROSCOPE.

NO. 74 SPENCER MICROSCOPE.

This microscope has been re-designed, rebuilt, enlarged, and greatly improved. It is an inexpensive but exceedingly well made instrument for the examination of any substances that do not require a very high magnification, as, for example, starches, drugs, earths, cements, and other commercial articles, such as fibres and fabrics, meat for suspected parasites, paper making materials, fruits, etc. It will be found exceedingly satisfactory for work in elementary zoology and botany, as taught in common schools, and for the examination of insect and food life. No better gift can be placed in the hands of an inquiring boy or girl who is beginning the study of animal or plant life. Every home should possess one. It affords an abundance of amusement, awakens interest and provides instruction.

For all commercial, household or elementary school purposes, this microscope affords a wide field of usefulness, instruction and pleasure.

SPECIAL FEATURES.

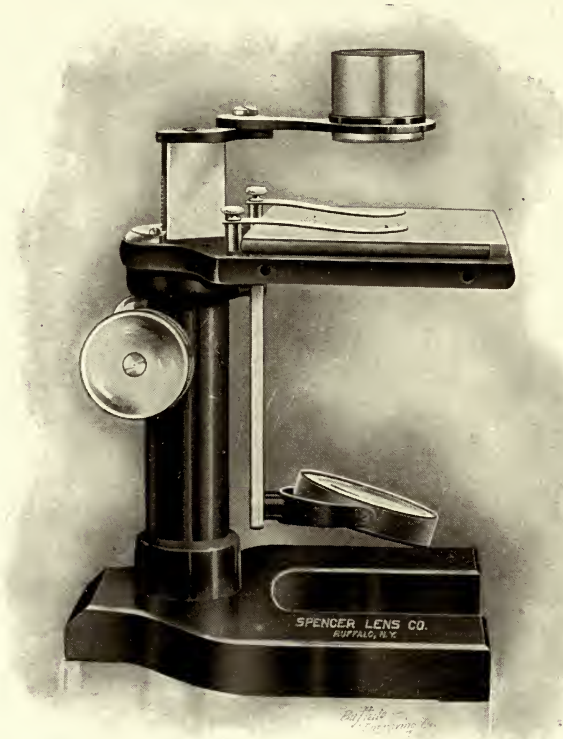
- I. Size of stage 105mm. wide, 110mm. deep.
- II. Distance from optical axis to base of arm 75mm.
- III. Rack and pinion adjustment.
- IV. Handle arm for carrying.
- V. Black alcohol-proof finish.
- VI. Brass stage.

Prices include a polished wood cabinet.

| | | |
|------|---|----------|
| 74X. | Microscope, with one eyepiece, one special divisible objective (32mm. and 14mm.), single nosepiece..... | \$ 17.50 |
| 74Y. | Microscope, same as above, with two eyepieces and an additional 5mm. special objective..... | 23.00 |
| 74Z. | Microscope, same as 74Y, with double nosepiece..... | 27.00 |
| 74A. | Microscope, with one eyepiece, regular 16mm. and 4mm. objectives | 25.50 |
| 74B. | Microscope, same as 74A, with double nosepiece..... | 29.50 |

The divisible objective (32mm. and 14mm.) gives with the 4× eyepiece, magnifications of 17 and 65 diameters; with the 8× eyepiece, 35 and 130 diameters.

DISSECTING MICROSCOPES.



No. 82A.

82. Dissecting Microscope. This microscope meets the demands of the most critical. It is a thoroughly serviceable, high grade, convenient instrument for general laboratory purposes, at a very moderate cost. Its stability, accuracy and ease of manipulation and qualities which make for durability will be especially appreciated.

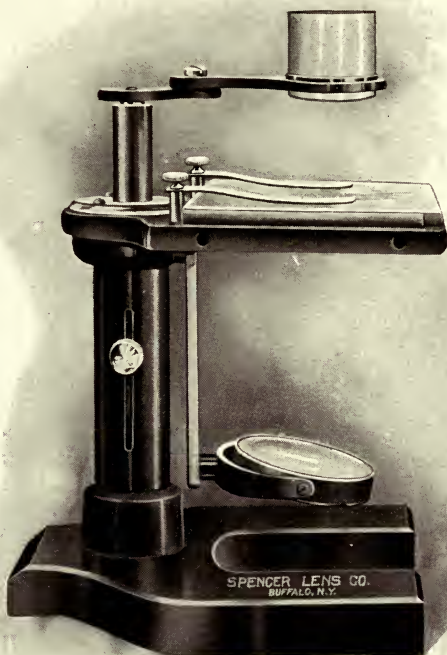
The base is of the standard horseshoe pattern and is finished in an alcohol-proof black lacquer. Its very large stage is covered by a heavy polished glass plate 75mm. x 100mm., fastened so that it can be easily removed. A black and white background is provided. It is focused by a diagonal rack and pinion with bearings which provide great steadiness and a very smooth movement of long range so that lenses of long focus may be used. It has two milled pinion heads which allow either hand to be used in focusing.

The lens arm is jointed and of such length that the lens may be used over any part of the stage. The mirror fork is substantially fastened to a swinging mirror bar and carries a large mirror 50mm. diameter which will illuminate the whole stage; one side is concave, the other plane.

The doublet magnifiers are of superior quality, flat field, good definition; in fact, far superior to the usual grade of Coddington magnifiers. For the most exact work, we advise the use of the triple aplanatic lenses.

Prices include a hardwood cabinet.

| Cat. No. | Lens and Magnification | Equivalent Focus, mm. | Working Distance, mm. | Price |
|----------|---------------------------|-----------------------|-----------------------|---------|
| 82 A | 9× Doublet | 27.8 | 15 | \$ 9.00 |
| 82 B | 6× and 12× Doublet | 41.6 and 20.8 | 22 and 12 | 9.75 |
| 82 C | 9× Triple Aplanat | 27.8 | 24.5 | 11.75 |
| 82 D | 6× and 12× Triple Aplanat | 41.6 and 20.8 | 36.8 and 13.4 | 15.25 |



No. 84A.

84. Dissecting Microscope. In this microscope we have combined efficiency with a low cost, adapting it to general laboratory use where the best student work is done.

The base is of the standard shoe pattern and is finished in an alcohol-proof black lacquer; the rigid pillar is nickel plated and the stage is finished with the same black lacquer.

The mirror, 50mm. in diameter, is concave on one side, has a plane white porcelain surface on the other and is securely fastened to the pillar. The large brass stage is covered with a polished glass plate 75 mm. x 100 mm. that may be easily removed for cleaning, an unusual feature in a stand of this grade, as is also the jointed lens arm by which all parts of the stage may be reached. Holes at the side of the stage permit the use of wooden hand rests. The lenses are focused by means of a button at the side of the pillar which moves the strong cylindrical lens arm support whose bearings extend the whole length of the inner surface of the hollow pillar, giving a steady, smooth movement so that high-power lenses can be comfortably used.

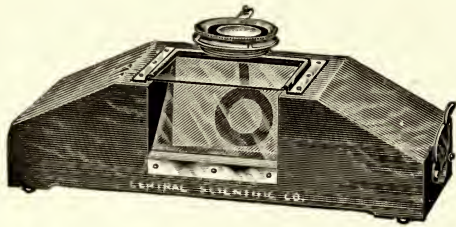
This microscope is equipped with different magnifiers indicated by the letters: A, B, C.

Prices include a neat hardwood cabinet.

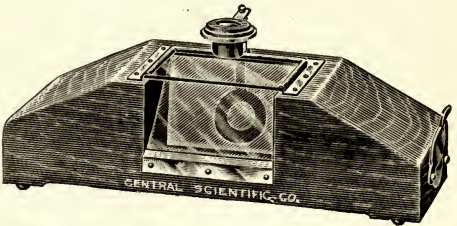
| Cat. No. | Lens and Magnification | Equivalent Focus, mm. | Working Distance, mm. | Price |
|----------|------------------------|-----------------------|-----------------------|---------|
| 84 A | 9× Doublet | 27.8 | 15 | \$ 6.75 |
| 84 B | 6× and 12× Doublet | 41.6 and 20.8 | 22 and 12 | 7.50 |
| 84 C | 9× Triple Aplanat | 27.8 | 24.5 | 9.50 |

Metal Hand Rests, per pair. \$.75

Doublets and Triple Aplanatic magnifiers listed on page 20.

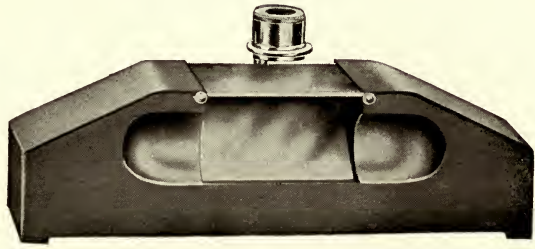


No. 7500.



No. 7502.

7500. **Dissecting Microscope**, Barnes, hardwood polished base, movable glass stage, mirror, and two lens magnifier. Fine screw and also sliding adjustment. Block is provided with pocket for holding dissecting tools. Each 1.50
- 7500A. **Magnifier**, less holder35
- 7500B. **Holder only** for above magnifier; vertical rod $\frac{1}{4}$ inch in diameter.. .25
- 7500C. **Magnifier and Holder**, complete..... .60
- 7500D. **Block only**, less magnifier and holder..... .90
- 7500E. **Glass Mirror**. Each 10c; per dozen..... .90
- 7500F. **Glass Stage**. Each 10c; per dozen..... .90
7502. **Dissecting Microscope**, same block as No. 7500, fitted with 12 \times Doublet Magnifier which gives a perfect definition. Each.... 2.25
- Other size Doublets furnished if desired (see page 20), in place of 12 \times at same price.
- 7502A. **Holder for doublet magnifiers**..... .25

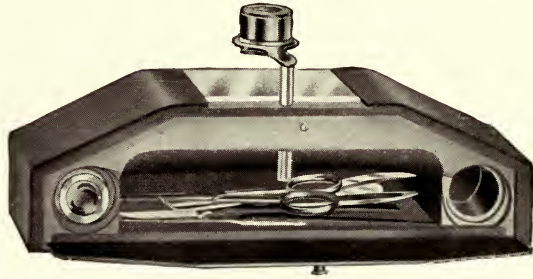


No. 7505.

Front View.

7505. **Improved Dissecting Microscope**. This instrument has a number of improvements over the old forms. The parts of the block at either side of the mirror are cut out to allow light from the sides to strike the mirror, thus doing away with necessity of the operator facing the source of light in order that the light may strike the mirror.
- The block is hollow beneath and back of the mirror, forming a convenient receptacle for dissecting tools and lenses. This is closed by a door which is hinged at the lower edge of the block. This is most convenient because it is not necessary to remove the specimen from the stage or the lens from the holder when a new dissecting tool or lens is wanted.
- The lens is held in an arm which permits movement from side to side and provides for focusing. A black and white metal background is furnished with each instrument.

See next page for prices and back view.



No. 7505.

Back View. (See description, page 18.)

| | |
|--|---------|
| 7505. Dissecting Microscope, with 9× Doublet..... | \$ 2.50 |
| 7505A. Dissecting Microscope, with 12× Doublet..... | 2.50 |
| 7505B. Dissecting Microscope, with 9× Triple Aplanat..... | 5.25 |
| 7505C. Dissecting Microscope, with 12× Triple Aplanat..... | 5.25 |

7507. DEMONSTRATION MICROSCOPE.



With the exception of the tube, this stand is made entirely of aluminum, thus making it very light.

This, with the convenient handle, makes it superior to all others for handing from person to person during class demonstration. The objective is accurately and easily focused by a spiral movement which is so arranged that the objective may be securely fastened in any focus. The objective is always in sight, thereby being easier to focus, and to exchange for another. The slide is placed upon the stage as in any other microscope and there is no danger of disturbing the cover glass. Furnished with 8× eyepiece and 16mm. objective\$11.00

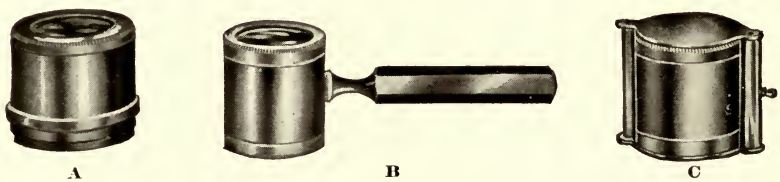
No. 7507.

MAGNIFIERS.

In the manufacture of these Magnifiers the same care has been used and the same exact methods followed as in formulating and making microscope objectives, so that they are of a far better quality than the cheaper class of lenses usually offered.

The Doublet and Aplanatic Magnifiers are furnished in three different styles of mounting, according to the different purposes for which they are to be used. "A" for Dissecting Stands; "B" with hexagonal handle, for Desk Use; "C" in Folding Pocket Case.

DOUBLETS.



These are made with special reference to producing the best magnifier of the kind made. They consist of two plano-convex lenses very substantially mounted. They give excellent definition and an exceptionally large, flat field.

| No. | Magnifi- cation | Focal Distance | | Working Distance mm. | Real Field mm. | Price | |
|------|--------------------|------------------|-------------------|----------------------------|----------------------|------------------|-------------|
| | | Milli- meters | Inches Approx. | | | Mount. a or b | Mount. c |
| 7508 | 6× | 41.6 | 1.6 | 22 | 22 | \$ 1.00 | \$ 1.25 |
| 7510 | 9× | 27.8 | 1.1 | 15 | 16 | 1.00 | 1.25 |
| 7512 | 12× | 20.8 | 0.8 | 12 | 11 | 1.00 | 1.25 |
| 7514 | 18× | 13.9 | 0.5 | 8 | 8 | 1.00 | 1.25 |

TRIPLE APLANATICS.



For all purposes which require the use of lenses of the highest type. They are free from astigmatism and distortion and are perfectly achromatic. The working distance is very great, as will be seen by the following table.

| No. | Magnifi- cation | Focal Distance | | Working Distance mm. | Real Field mm. | Price |
|------|--------------------|------------------|--------|----------------------------|----------------------|---|
| | | Milli- meters | Inches | | | Mount. a, b or c Specify in ordering |
| 7519 | 9× | 27.8 | 1.1 | 24.5 | 20 | \$ 3.50 |
| 7521 | 12× | 20.8 | 0.8 | 18.4 | 15 | 3.50 |
| 7523 | 18× | 13.9 | 0.5 | 12.1 | 10 | 3.50 |



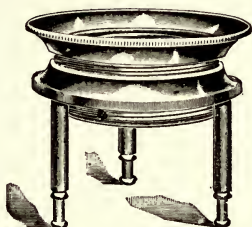
No. 7528.



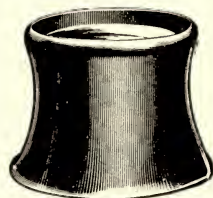
Nos. 7532-34.



Nos. 7538-40.

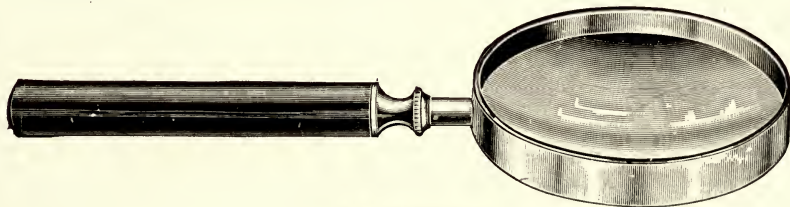


No. 7542.



No. 7544.

| | | |
|-------|--|---------|
| 7528. | Magnifier, pocket, the mountings are of well seasoned rubber, very light and durable; in every respect a superior article; diameter of lens, 18 mm..... | \$ 0.35 |
| 7530. | Magnifier, pocket, diameter of lens, 30mm..... | .55 |
| 7532. | Magnifier, pocket, diameters of lenses, 15 and 18mm..... | .55 |
| 7534. | Magnifier, pocket, diameters of lenses, 28 and 30mm..... | .90 |
| 7536. | Magnifier, pocket, diameters of lenses, 12, 15 and 18mm..... | .65 |
| 7538. | Magnifier, or "Linen Tester," magnification about 10 diameters, brass mounting, with $\frac{1}{4}$ in. square aperture..... | .27 |
| 7540. | Magnifier, or "Linen Tester," with $\frac{1}{2}$ in. square aperture..... | .27 |
| 7542. | Magnifier, tripod, giving a large, clear field and sufficient magnifying power for elementary botanical and zoological studies. The lens is focused by screwing up or down in the brass frame..... | .44 |
| 7544. | Magnifier, watchmakers' glass, double convex lens in vulcanite mounting. Focus, 25mm..... | .45 |
| 7548. | Magnifier, watchmakers', two lenses of different focus [25 and 60mm.]. The front lens (25mm.) can be removed by unscrewing, thus permitting the use of the rear lens (60mm.)..... | .85 |



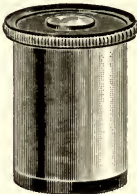
Nos. 7550-60.

| | | |
|-------|-------------------------------------|------|
| 7550. | Reading Glass, diameter, 50mm..... | .55 |
| 7552. | Reading Glass, diameter, 62mm..... | .72 |
| 7554. | Reading Glass, diameter, 75mm..... | .90 |
| 7558. | Reading Glass, diameter, 100mm..... | 1.80 |
| 7560. | Reading Glass, diameter, 112mm..... | 2.10 |

HUYGHENIAN EYEPIECES.

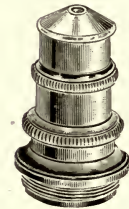
In arranging the focal distance of the Spencer eyepieces the method first used by Professor Abbe in connection with his compensating eyepieces was adopted, marking them with figures that indicate in each case how many times the eyepiece enlarges the objective image, the tube length being constant. For example, the 4X eyepiece magnifies the objective image four times, provided it is used with a tube length of 160mm. and the magnification of the 8X eyepiece will be twice as great under similar conditions.

The eyepieces are made to fit the standard tube of the Royal Microscopical Society and are interchangeable with those of European makers.



| | | | | | |
|------------------|------------------|----------------------|----------------------|------------------|--------------------|
| Catalog Number | 7570 | 7572 | 7574 | 7576 | 7578 |
| Magnification | 3X | 4X | 6X | 8X | 9X |
| Equivalent Focus | 50mm. (2 in.) | 40mm. (1 1/2 in.) | 30mm. (1 1/4 in.) | 25mm. (1 in.) | 20mm. (3/4 in.) |
| Price | \$1.50 | 1.50 | 1.50 | 1.50 | 1.50 |

ACHROMATIC OBJECTIVES.



The Spencer objectives are made in accordance with methods first adopted by Professor Abbe by which the complete mathematical formulation of the objective is first perfected, all of its elements clearly determined, such as the actual indices of refraction in the several optical glasses employed, the radii of the curved surfaces, the thicknesses of the lenses and the distances of separation, so that this work of prior calculation does away with all the uncertainties of experimental optics. We thus obtain a greater degree of perfection and a much greater uniformity than it is ever possible to obtain in microscope objectives made in other ways. In these calculations especial consideration is given to securing:

FLATNESS OF FIELD

CRITICAL DEFINITION

RESOLUTION

LONG WORKING DISTANCE

| Catalog Number | Focal Length | | Numerical Aperture | Working Distance mm. | Price |
|----------------|--------------|-------|--------------------|----------------------|-------|
| | mm. | in. | | | |
| 7580 | 40 | 1 3/4 | 0.10 | 50.0 | 4.50 |
| 7582 | 32 | 1 3/8 | 0.10 | 36.0 | 4.50 |
| 7583 | 25 | 1 | 0.30 | 9.0 | 5.00 |
| 7584 | 16 | 2/3 | 0.30 | 5.0 | 5.00 |
| 7586 | 12 | 1/2 | 0.40 | 3.0 | 8.00 |
| 7588 | 8 | 1/3 | 0.50 | 1.5 | 8.00 |
| 7590 | 5 | 1/5 | 0.70 | 0.50 | 8.00 |
| 7592 | 4 | 1/6 | 0.75 | 0.60 | 8.00 |
| 7594 | 4 | 1/6 | 0.85 | 0.40 | 8.00 |
| 7596 | 3 | 1/8 | 0.85 | 0.30 | 8.00 |
| 7598 | 2 | 1/8 | 1.30 | 0.16 | 27.00 |
| 7599 | 1.8 | 3/16 | 1.30 | 0.13 | 27.00 |
| 7600 | 1.5 | 1/8 | 1.30 | 0.10 | 40.00 |

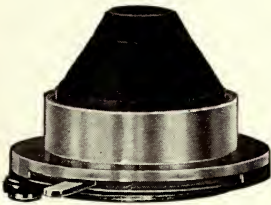
Table of Magnifications on Next Page.

MAGNIFICATION TABLE FOR OBJECTIVES AND EYEPIECES.

Tube length 160mm., distance of image 250mm.

| | Objective. | HUYGHENIAN EYEPIECES | | | | | Objective. |
|------------------------|------------|----------------------|-----|-----|------|------|------------|
| | | 3× | 4× | 6× | 8× | 9× | |
| Dry Objectives | 40 mm. | 13 | 19 | 25 | 35 | 40 | 40mm. |
| | 32 mm. | 18 | 25 | 35 | 47 | 54 | 32mm. |
| | 25 mm. | 26 | 34 | 47 | 66 | 75 | 25mm. |
| | 16 mm. | 37 | 50 | 64 | 75 | 80 | 16mm. |
| | 12 mm. | 70 | 90 | 120 | 145 | 195 | 12mm. |
| | 8 mm. | 100 | 125 | 160 | 210 | 260 | 8mm. |
| | 5 mm. | 165 | 200 | 280 | 360 | 450 | 5mm. |
| | 4 mm. | 210 | 260 | 370 | 465 | 550 | 4mm. |
| Imm. Objectives | 3 mm. | 275 | 375 | 460 | 620 | 700 | 3mm. |
| | 2 mm. | 400 | 510 | 700 | 900 | 1030 | 2mm. |
| | 1.8 mm. | 445 | 570 | 760 | 1000 | 1170 | 1.8mm. |
| | 1.5 mm. | 510 | 670 | 840 | 1120 | 1350 | 1.5mm. |
| | | | | | | | |

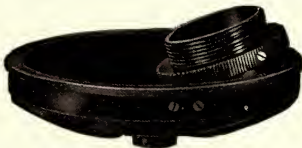
When using the camera lucida with the paper lying on the table add 60% to the above magnifications.

ABBE SUBSTAGE CONDENSER.

In order to secure the best results with objectives of high power an Abbe Condenser must be used.

The Condenser illustrated has an aperture N. A. 1.20 and meets all the requirements of practical work. It is fitted with an iris diaphragm beneath to modify the amount of light, and is also provided with a ring beneath the iris to hold a blue glass for cutting out the yellow rays of artificial light; or to hold a "center stop" which to some extent will provide dark field illumination. The mounting is like the cut for the friction collar substages or is swung on the arm of the drop-swing Condenser mounting.

| | | |
|-------|---------------------------------|---------|
| 7601. | Abbe Condenser, N. A. 1.20..... | \$ 7.50 |
| 7602. | Abbe Condenser, N. A. 1.42..... | 9.00 |

REVOLVING NOSEPIECES.

No. 7603.



No. 7605.

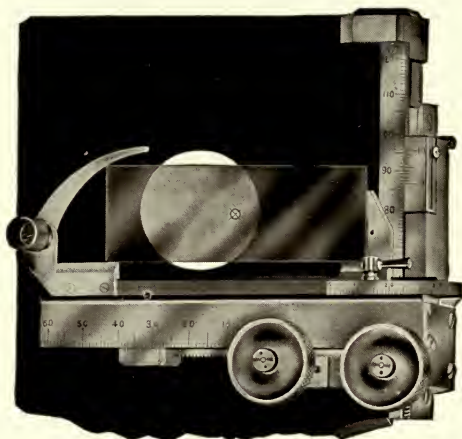
These nosepieces are of the revolving circular type, dustproof, and are valuable accessories when the Microscope is supplied with more than one objective. They save time and prevent damage and loss of objectives. When ordered with the Microscope the objectives are so fitted that they are par-focal.

| | | |
|-------|------------------------|------|
| 7603. | Double Nosepiece | 4.00 |
| 7605. | Triple Nosepiece | 5.50 |

MICROMETERS.

| | | |
|-------|--|------|
| 7606. | Stage Micrometer, glass object slide with finely ruled scale, 1mm. divided into 100 parts..... | 3.50 |
| 7610. | Eyeiece Micrometer, glass disc with finely ruled scale to be laid upon the diaphragm of an ordinary Huyghenian eyepiece, 5mm. divided into 50 parts (to 0.1mm.)..... | 1.25 |
| 7612. | Eyeiece Micrometer, same as 7610, divided into 100 parts (to 0.05mm.) | 1.50 |

MECHANICAL STAGES.



No. 7618.

The mechanical stage is a convenience that any one who has used a microscope to any extent will readily appreciate. For microscopical projection it is almost indispensable.

7617. Mechanical Stage. Can be instantly and firmly attached by means of its clamps to any rectangular microscope stage that has a side length of 7.5cm. or more, and may be just as readily removed. A stop at the front always insures its return to the same position on the microscope stage, so that should work be interrupted and the mechanical stage removed, when it has been replaced, any part of the specimen under observation may be instantly found by noting the vernier readings. The movements of this mechanical stage are by diagonal rack and pinion, and are entirely firm and reliable, permitting the most delicate adjustments. The range of movement is large in both directions, giving 63 mm. lateral motion and a vertical movement of 35 mm. This slide rests upon the surface of the microscope stage and is held in place at one end by a spring clip and at the other by an adjustable stop, permitting the use of slides of varying sizes.

For the very deep stages of microscope No. 40 this mechanical stage does not have forward and backward range enough to take advantage of the deep stage. No. 7618 should always be ordered for these microscopes. This stage is heavily plated and is in every way most durable. Price in case..... \$ 16.00

7618. New Registering Mechanical Stage, attachable to any microscope stage. This stage is a modification of No. 7617, so that the vernier reading designating the locations of objects taken on one microscope will register with the readings for the same objects taken on any other microscope. On account of its adjustability this is the only mechanical stage which can be used to greatest advantage on the new microscope No. 40, with the great distance from the optical axis to the base of the arm. When so used it has a forward and backward excursion of 38 mm. and a lateral excursion of 60mm.—greater than that of any other stage.

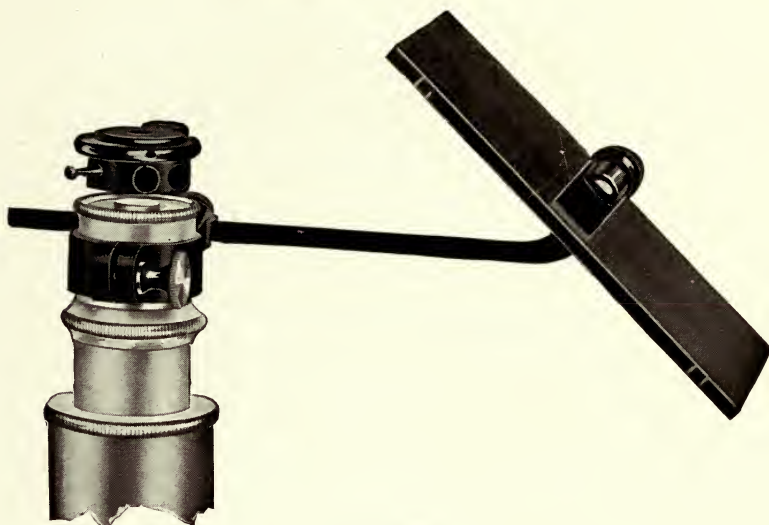
The mechanism of this stage is exactly like that of No. 7617. The slide is held so far away from the working parts of the stage that its inner edge may be reached with any objective made. There are no projecting parts to hit the objective when revolved in the nosepiece. Price in case, with centering slide.....

20.00

7619. Mechanical Stage, same as No. 7618, without centering slide.....

18.00

CAMERA LUCIDAS.

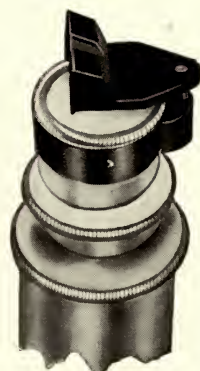


No. 7620.

7620. **Camera Lucida, Abbe's.** This Camera Lucida is made to satisfy the demands of the serious laboratory worker. It has a very large mirror, 70mm. \times 105mm., which is supported on adjustable, graduated mirror bar. The prism is permanently centered and gives a clear, colorless, full sized field. The light from it is modified by a series of smoked screens of different densities which may be revolved in and out of line between the mirror and the prism. There are no loose parts to get out of place when the prism is moved in and out of the optical center. It is made for the standard size microscope tubes, now in use by practically all American and European makers. Complete, in hardwood case..... \$ 10.00

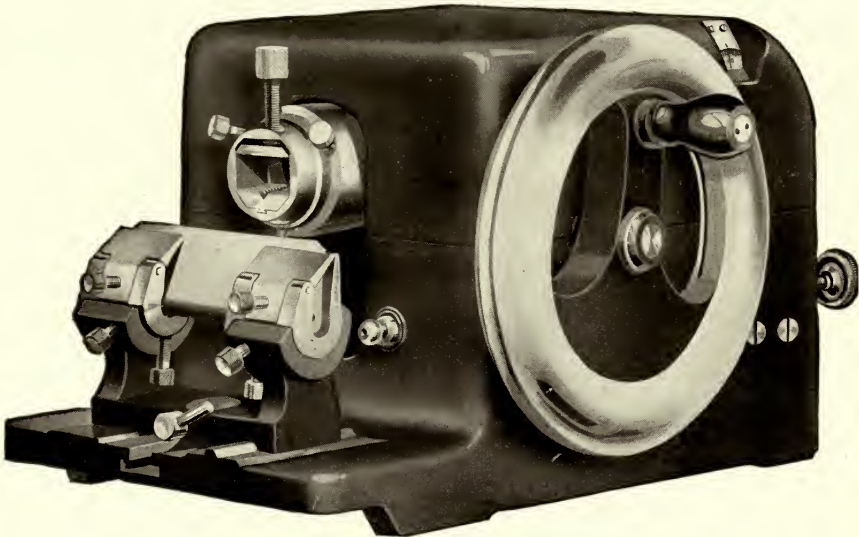
7622. **Camera Lucida, Wallaston.** This is a simple prism, so mounted that when the microscope tube is inclined the image is apparently thrown upon the paper beneath and the pencil point is plainly seen at the same time. The camera is held in place by a spring clamp which fits around the draw tube. It is so mounted that the prism may be easily swung in and out of the optical axis. It is a very good, inexpensive Camera Lucida

4.50



No. 7622.

MICROTOMES.



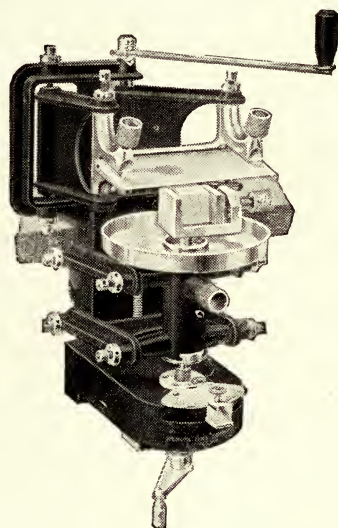
No. 7701A.

7701A. Rotary Microtome. The rotary microtome is universally recognized as the most convenient and expeditious microtome for paraffin work. Its general acceptance, especially for critical work, has been greatly hindered because heretofore it could not be depended upon to cut, one after another, accurate sections of definite uniform thicknesses. This inherent inability is due to several principles in construction which have been eliminated in this New Spencer Microtome;—it being designed after an entirely new construction to remedy these defects, and to improve upon the good points as well.

By all odds the most important element is an accurate and reliable feed mechanism. This and rigidity are vital. In practically all the rotary microtomes heretofore made, the object is fastened in one way or another to a block which passes up and down on a perpendicular support. In most of them the feed mechanism is also fastened to this block. Any imperfection, therefore, in the fitting of this block to its perpendicular slideway vitiates the accuracy of the section, and it is practically impossible to fit a block to a support loosely enough to work up and down freely and at the same time tightly enough to eliminate lost motion. Even though these parts might be fitted perfectly, a little wear will soon produce lost motion.

Complete with one knife, handle and back for sharpening, and with three object discs \$100.00

An eight page descriptive pamphlet of this microtome will be sent upon request.



No. 7703.

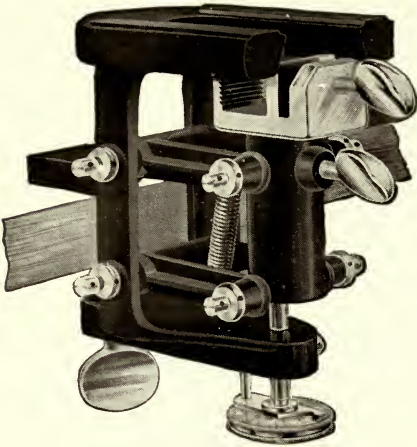
7703. **Automatic Laboratory Microtome.** This microtome has become very popular for general laboratory purposes. The peculiar construction of the microtome does away with all sliding parts. The knife carrier is held at the end of swinging arms, one of which is longer than the other, which gives to the knife a turning as well as a sliding motion. This motion is peculiarly adapted to frozen section work and is excellent also for embedded tissue.

The knife is operated by a flexible arm independent of the swinging arms holding the knife.

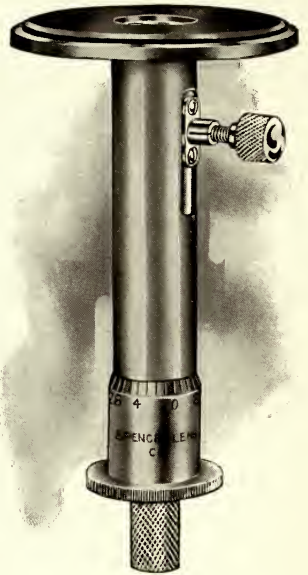
The object clamp is fastened by a clamp screwed into a vertically moving socket which socket is connected to the main frame by two vertically moving arms. These arms are pivoted to the main frame by steel pivot screws and check nuts just as is the case with the arms carrying the knife.

This object clamp is raised and lowered by means of a fine vertical micrometer screw at the lower end of which is a ratchet wheel into the teeth of which a pawl engages. This pawl is connected by means of a lever to a vertical shaft on the upper end of which is fastened the lever operating the knife. Thus the tissue is automatically fed upward for another section when the knife is drawn back for the next cut.

The whole instrument can be firmly clamped to a bench or table. It is neatly finished and all in all is a most desirable microtome. Complete with one knife and object clamp for paraffine or celloidin, in case..... \$ 45.00



No. 7704.



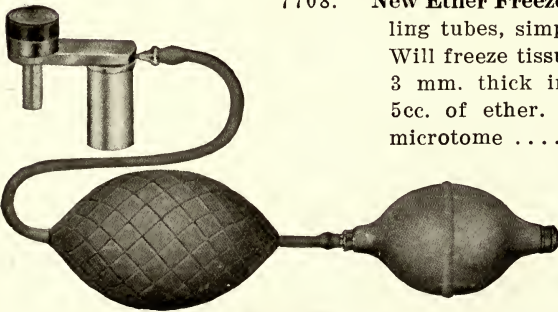
No. 7706.

7704. **Table Microtome.** This Microtome is adaptable to all kinds of sectioning, including the freezing method, the Ether Freezer, No. 7708, being applicable to it. The object is held firmly in an adjustable clamp placed in a vertically moving socket held by hardened steel proof screws in two parallel vertically swinging arms similarly attached to the main frame. This movement is regulated by a micrometer screw with graduated disc and index plate. The finest feed is five microns. The knife travels on glass ways set in grooves in the metal. An ordinary razor, or section knives, may be used for sectioning. The instrument is attached to the table edge or other support by a screw clamp..... \$ 12.50

7706. **Hand Microtome** is intended for rapid class work or where expense is the chief consideration. It serves its purpose admirably, both for vegetable and animal tissues, as the feed is accurate and the clamp holds the object firmly. The finest feed is 10 microns. The knife slides over a glass plate through which the object is fed by the screw.

All exposed parts are nicked to prevent tarnishing and the screw is entirely enclosed, protecting it from dust and mechanical injury. 6.00

7708. **New Ether Freezer.** No bottles, no entangling tubes, simple, compact and efficient. Will freeze tissue 15mm. in diameter and 3 mm. thick in one minute using only 5cc. of ether. It can be used on any microtome 6.00



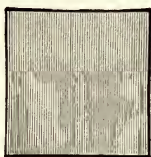
No. 7708.

SLIDES AND COVER GLASSES.



No. 7718-20.

7718. Glass Slides, white, 75x25mm. (3"x1"), ground edges, per gross.... \$ 1.00
 7720. Glass Slides, white, 75x25mm. (3"x1"), ground edges, extra thin, per gross 1.10
 7722. Glass Slides, concave centers, per doz..... .60



No. 7726-30.



No. 7731-38.

Cover Glasses are put up in ½-oz. boxes and made in the following sizes, square or round:

| | | | |
|-------|-------|-------|-------|
| 15mm. | 18mm. | 22mm. | 25mm. |
| ⅝ in. | ¾ in. | ⅞ in. | 1 in. |

Thickness of cover glasses is specified by number as follows:

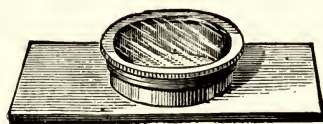
| | | |
|--------------------|--------------------|-------------------|
| No. 1. | No. 2. | No. 3. |
| 0.13 to 0.17mm. | 0.17 to 0.25mm. | 0.25 to 0.50mm. |
| 1/200 to 1/150 in. | 1/150 to 1/100 in. | 1/100 to 1/50 in. |

When ordering, state shape, thickness, size and quantity desired.

7726. Square, No. 1, any size, per ½ oz..... .45
 7728. Square, No. 2, any size, per ½ oz..... .38
 7730. Square, No. 3, any size, per ½ oz..... .33
 7734. Round, No. 1, any size, per ½ oz..... .55
 7736. Round, No. 2, any size, per ½ oz..... .45
 7738. Round, No. 3, any size, per ½ oz..... .38
 7740. Rectangular, No. 2, 22 x 40mm., per ½ oz..... .50
 7742. Rectangular, No. 2, 24 x 50mm., per ½ oz..... .50
 7744. Labels, for glass slides, 22mm. square, per box of 100..... .10
 7746. Labels, for glass slides, 22 x 15mm., per box of 100..... .10



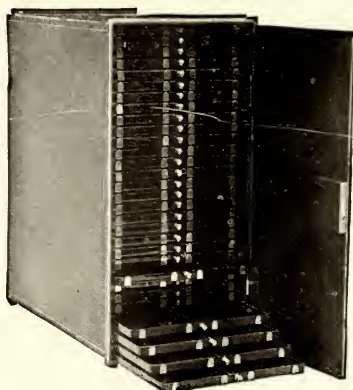
No. 7748.



No. 7753.

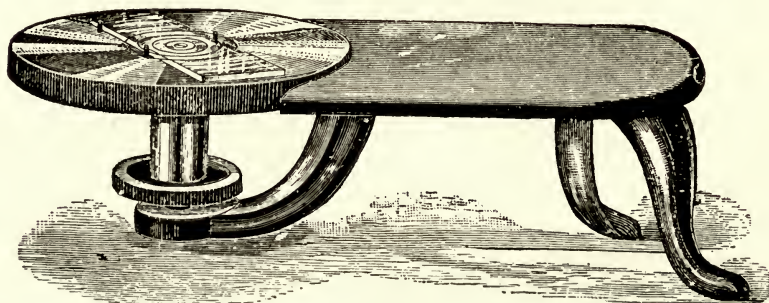
7748. Life Slide, Holman's..... 1.35
 7750. Current Slide, Holman's..... 1.35
 7752. Syphon Slide, Holman's..... Net 4.00
 7753. Life Box, consisting of two glass plates, one on a metal slip, the other adjusted to it by a sliding sleeve. For examining organisms in fluid. Diameter of cell 25mm., maximum depth, 8mm., slip 32 x 80mm. 2.50
 3728. Animalculae Stage, on a glass slide 3"x1"..... 1.10
 7756. Mounting Cells, glass, 15 to 22mm. diam.; 3 to 9mm. deep, per doz.90
 7758. Mounting Cells, rubber, 15 to 22mm. diam.; 0.5 to 3 mm. deep, per doz.40

Stains and Cements, see pages 85 to 87.



No. 7760.

7760. **Minot's New Metal Slide Cabinet.** This cabinet, designed by Dr. Chas S. Minot, is very compact, occupying much less space than wooden cabinet and affording much better protection against fire. It is strongly made of metal throughout, neatly finished on the outside in maroon-colored japan with bronze stripes. The inside finish is in black japan. It contains 30 japanned metal trays, each holding 24 glass slides, 75 x 25mm. The trays are provided with convenient knobs and with card-holders. The cabinet is furnished with a good brass lock and measures 36.3cm. in height, 32.5cm. in depth and 17.5cm. in width, outside. Price, complete with 30 trays \$ 20.00
7762. **Slide Boxes**, grooved to hold 25 slides, numbered and indexed, per dozen 1.00
7764. **Slide Boxes**, grooved to hold 12 slides, numbered and indexed, per dozen66
7766. **Slide Boxes**, grooved to hold 100 slides, cloth covered, hinged cover and catch, each40
7768. **Slide Trays**, map form, to hold 14 slides, each25
7770. **Slide Trays**, map form, to hold 20 slides, each28
7772. **Slide Mailing Cases**, tops, middles or bottoms, per dozen11



No. 7774.

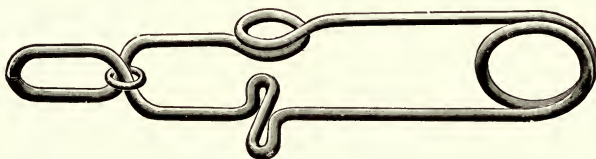
7774. **Turn Table**, improved centering, very delicate and accurate 4.00
7776. **Warming Table**, copper. For drying and mounting 1.50
7778. **Paraffine Imbedding Box.** Two angle pieces of metal with metal plate, 10mm., 20mm. or 30mm. high, each70

DISSECTING INSTRUMENTS.



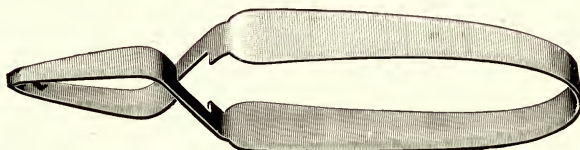
No. 7820-22.

7820. Blow-pipe. Nickel-plated; 125mm. long..... \$ 0.15
 7822. Blow-pipe. Nickel-plated; 188mm. long; with very small orifice; especially suited for very small vessels..... .30
 7824. Bristles, Shoemaker's. Extra quality; useful as seekers for tracing out fine ducts and vessels; per 100..... .12



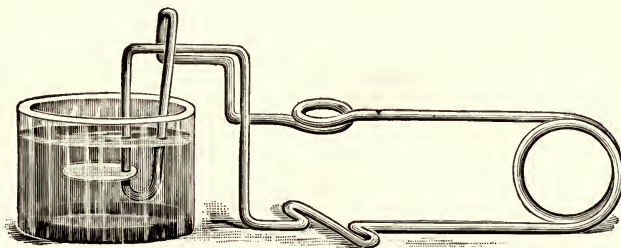
No. 7826.

7826. Forceps, Cover-Glass, Stewart's, Steel Wire (with ring), nickel-plated, each15



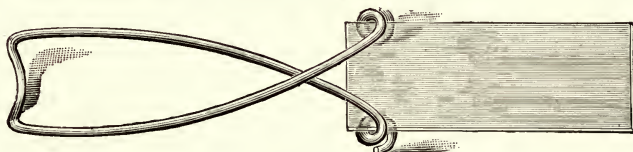
No. 7828.

7828. Forceps, Cover-Glass, Cornet's, best quality, nickel-plated, each... .50



No. 7830.

7830. Forceps, Cover-Glass, Kalteyer's, for staining in dish, each..... .25



No. 7832.

7832. Forceps, Kirkbride's, for staining on slide, each..... .10



No. 7834.

7834. Forceps, Cover-Glass, Thin bent blades, file back, nickel-plated.... .65



No. 7836.

7836. Forceps, Novy's, with lock..... 1.00

**No. 7840.**

7840. Forceps, Dissecting, fine straight points, sharp; best steel; nickel-plated, 110mm. \$ 0.11

**No. 7842.**

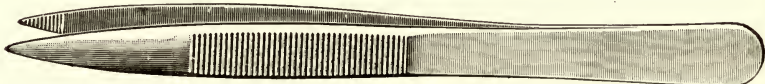
7842. Forceps, Dissecting, fine straight points, sharp; steel; nickel-plated; 88mm.20

**No. 7844.**

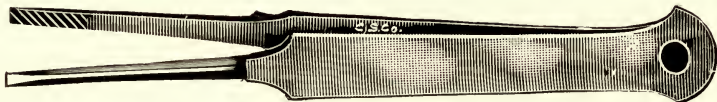
7844. Forceps, Dissecting, with guide pin, fine straight points, sharp; best steel; nickel-plated; 100 mm.40

**No. 7846.**

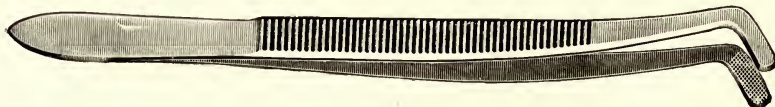
7846. Forceps, dissecting, with guide pin, fine curved points, sharp; best steel; nickel-plated; 100mm.40

**No. 7848.**

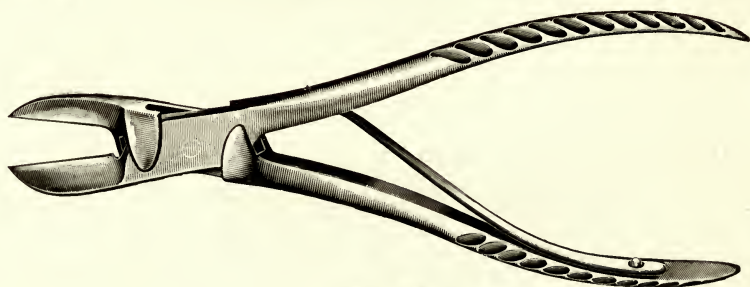
7848. Forceps, Dissecting, heavy; straight file-cut points; file back; nickel-plated; 125 mm.35

**No. 4915.**

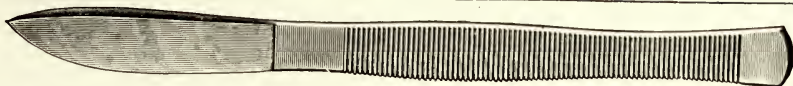
4915. Forceps, heavy steel, corrugated tip; 125 mm.15

**No. 7852.**

7852. Forceps, Pinning, bent blades; corrugated points and handles; each 1.50

**No. 7853.****No. 7854.**

7853. Forceps, Artery, self-closing, 60mm. long.50
 7854. Forceps, Bone-cutting, strong and accurate blades, 200 mm. long 2.10
 7856. Hooks and Chains, triple hooks, nickel plated.20

**No. 7862.**

7860. **Knife, Brain.** Finest steel, with ebony handle, blade 175 x 20mm... \$ 1.65
 7862. **Knife, Cartilage.** All steel, corrugated handle, 45mm. cutting edge .25

**No. 7864.**

7864. **Knife, Large Dissecting.** Suitable for cartilage work; solid steel handle, 115mm. cutting edge..... 2.00

**No. 7866-68.**

7866. **Needle, Dissecting.** Bone handle, clamping holder, 85mm. long, with one needle, each..... .06
 7866A. **Needles,** straight, as used in above holder, per doz..... .06
 7866B. **Needles,** bent, as used in above holder, per doz..... .10
 7868. **Needle, Dissecting.** Bone handle, clamping holder, 110mm. long, with one needle, each..... .09
 7870. **Needles,** only, to fit No. 7868, hook point or spear point, per doz... .17
 (For straight and bent needles, see Nos. 7866A, 7866B above.)

**No. 7876.**

7872. **Needle, Dissecting.** Handle of wood, straight, per doz..... .28
 7874. **Needle, Dissecting.** Handle of wood, bent, per doz..... .30
 7876. **Needle, Dissecting.** Best quality surgical needle, ebony handle, straight point40
 7878. **Needle, Dissecting.** Best quality surgical needle, ebony handle, curved point40

**No. 7880.**

7880. **Needle, Dissecting.** Best steel, spear point, single cutting edge.... .45
 7881. **Needle, Inoculating.** Platinum point set in glass handle, 4cm. long, each35

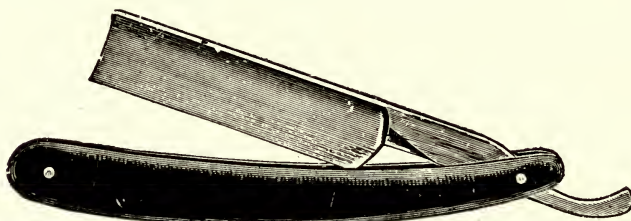
**No. 7882.**

7882. **Pan, Dissecting.** Tinned metal, with metal loops at the bottom for fastening limbs of animals during dissection, size 28.5 x 23.5 x 2.5cm., unlined22
 7883. **Pan, Dissecting.** Heavy tin, black enamelled with metal loops, size 29 x 19 x 3cm.25
 7884. **Pan, Dissecting.** Same as No. 7882, lined with wax on bottom.... .33
 7885. **Pan, Dissecting.** Same as No. 7883, with bottom covered with black wax45
 7886. **Pan, Dissecting.** Seamless, agate ware, 30cm. x 20cm. x 3cm., lined with cork on bottom..... .55



No. 7890.

7890. **Microtome Knife.** Blade is made from finest steel, evenly tempered; ebonized handle, with threaded, milled head rod, to hold knife for sharpening or section cutting; steel knife back for honing. Knife in velvet lined case..... \$ 7.50



No. 7892-94.

7892. **Razor, Section,** best quality; one side of blade flat, straight edge, folding handle, 85mm. 1.05
7894. **Razor, Section,** both sides of blade flat, straight edge, folding handle, 85mm.85
7896. **Razor, Section,** one side of blade flat, straight edge, fixed handle... 1.65
7898. **Saw, Bone,** aseptic, 8 inch blade..... 3.00



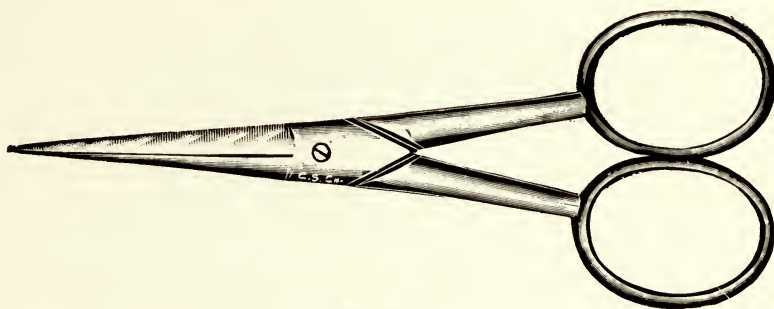
No. 7900-04.

7900. **Scalpel, dissecting;** good quality, ebony handle, 25mm. cutting edge. .25
7902. **Scalpel, dissecting;** good quality, ebony handle, 38mm. cutting edge. .25
7904. **Scalpel, dissecting;** good quality, ebony handle, 50mm. cutting edge. .25

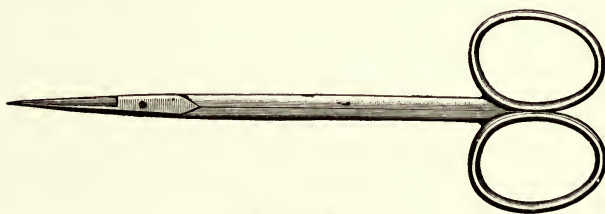


No. 7906-08.

7906. **Scalpel, dissecting;** best steel blade, steel handle, nickel-plated, 25mm. cutting edge40
7908. **Scalpel, dissecting;** best steel blade, steel handle, nickel-plated, 38mm. cutting edge40

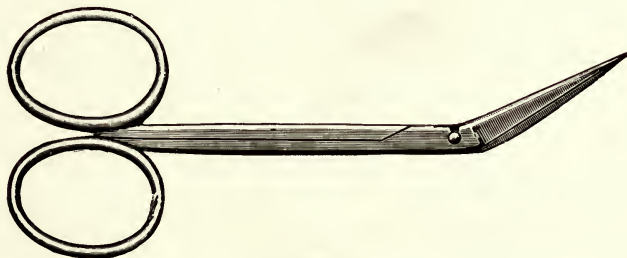
**No. 7910.**

7910. **Scissors, Dissecting.** Medium, straight, good steel, nickel-plated, 50mm. blade, fine points \$ 0.25

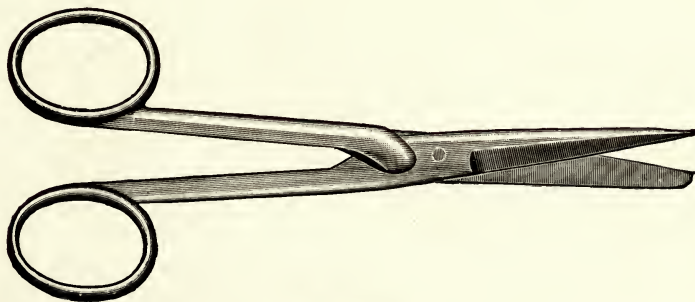
**No. 7912.**

7912. **Scissors, Dissecting.** Fine, straight points, best steel, nickel-plated, 25mm. blade50

7914. **Scissors, Dissecting.** Fine, curved points, best steel, nickel-plated, 25mm. blade60

**No. 7916.**

7916. **Scissors, Dissecting.** Fine elbow points, best steel, nickel-plated, 25mm. blade 60

**No. 7918.**

7918. **Scissors, Dissecting.** Heavy, straight, one blunt point, clamp lock, best steel, nickel-plated, 125mm.65



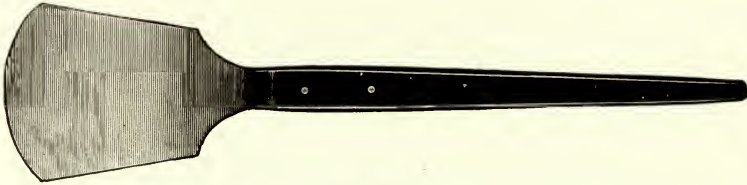
No. 7920.

7920. Section Lifter, all metal; German silver blade, 20 x 17mm. \$ 0.10



No. 7922.

7922. Section Lifter, thin, flexible German silver blade 40 x 20mm. ebony handle35



No. 7924.

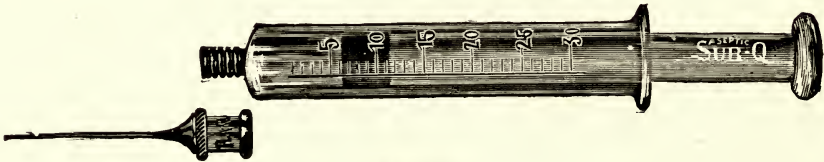
7924. Section Lifter, McFarland's. Large flexible German silver blade, 50 x 38mm.; ebony handle40



No. 7926.

7926. Seeker, best steel; blunt taper point; curved end is sharp edged and pointed. Length 175mm.25

7928. Syringe, Hypodermic; complete, with finger rest, 2 needles and vial in leather case, capacity $\frac{1}{2}$ dram. 1.50



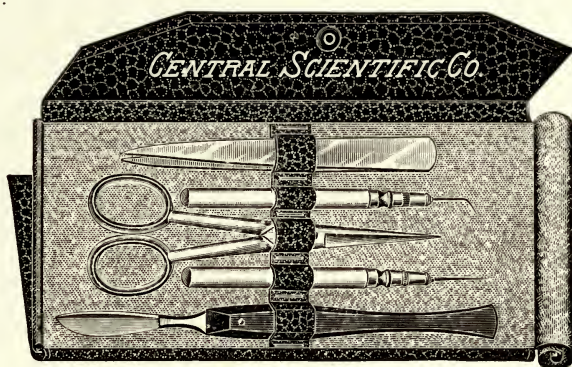
No. 7930.

7930. Syringe, "Sub-Q," Hypodermic, aseptic; all glass; asbestos packing; with two needles, capacity 1 dram. 2.00

7932. Syringe, Pocket Aspirating, 3 drams capacity, with 3 needles, 1 trocar and stop-cock in leather case. 4.50

7934. Syringe, Injecting, glass barrel, 3 drams capacity, metal frame, with finger rest attachment; plunger graduated to one-quarter drams, two-way stop cock; one each small, medium and large needles, with cleaners and a trocar. Complete in case. 4.50

7936. Tenaculum, steel shank, with tapering sharp hook; ebony handle.25

**No. 7940.**

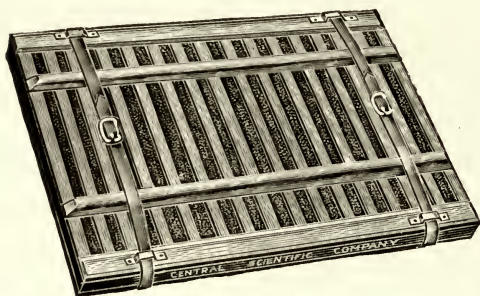
7940. **Dissecting Set.** A strong and neat leatherette case, with the following instruments: No. 7840 Forceps, 2 No. 7866 Needles (straight and bent), No. 7902 Scalpel, No. 7910 Scissors, each..... \$ 1.00
7942. **Dissecting Set,** same case and instruments as No. 7940, excepting 2 wood handle needles No. 7872 and No. 7874, in place of 2 No. 7866 needles, each90
7944. **Dissecting Set,** same case as No. 7940, with the following high grade instruments: No. 7844 Forceps, No. 7846 Forceps, 2 No. 7866 Needles, No. 7902 Scalpel, No. 7910 Scissors, each..... 1.50
- 7940A. **Case only** as used in sets Nos. 7940, 7942 and 7944..... .30
7946. **Dissecting Set.** A handsome leather case, with velvet lining and chamois flaps, with the following high grade instruments: 2 Scalpels, 1 Scissors, 1 Forcep, 1 Tenaculum, 1 Cartilage Knife, 1 Seeker, 1 Triple Hook and Chain, 1 Blow Pipe, each..... 3.75
- 7946A. **Case only** of above set..... 1.35

**No. 7948.**

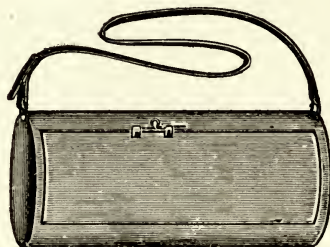
7948. **Belgian Oil Hone,** extra fine, 6 inches long, mounted on a wood block 1.65
7950. **German Blue-Green Water Hone,** 6 inches long. A rubber accompanies each hone27
7952. **Palm Oil Soap,** per cake, Net .10 per. doz. Net 1.00

**No. 7954.**

7954. **Razor Strop,** 21 x 2 inches. Double leather Russian red, India filled back, corrugated. Nickel plated U. S. cavalry swivel and handle.. .75
7956. **Dressing for strops,** per box..... .22

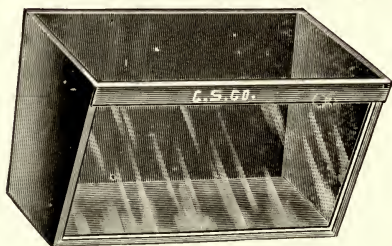


No. 8000.



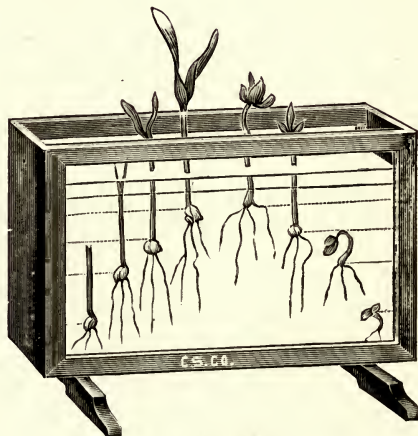
No. 8014.

8000. **Acme Flower Press.** Simple, Strong, Portable, Satisfactory. Being made of lattice work and using a rapidly absorbing paper, it is the **quickest drying press yet invented.** Hung in the sunlight and air, or over a stove, it dries specimens so quickly that their **natural colors are preserved.** From one to fifty or more specimens may be pressed equally well at one time \$ 1.85
8001. **Absorption paper,** 11 x 16 inches, as used in No. 8000. Per 100 sheets 3.00
8002. **Specie covers,** 11 x 17 inches. Per 100 sheets .22
8004. **Genus covers,** heavy manilla paper, size folded, 12 x 18 in. 100 sheets 2.00
8006. **Mounting board,** good quality, printed, 11 x 17 inches. Per 100 sheets 2.20
8008. **Mounting board,** good quality, plain, 11 x 17 inches. ... Per 100 sheets 1.65
8010. **Absorption paper,** size 12 x 19 inches. Per 100 sheets 1.50
8012. **Mounting paper,** neutral gray, plain, size 11 x 17 in. ... Per 100 sheets .50
8013. **Blotting paper,** heavy, 19 x 24 inches. Per quire .60
8014. **Vasculum or Collecting Case.** Metal finely enameled in green. The door opens the entire length. Size, 5 x 7 $\frac{7}{8}$ x 15 $\frac{3}{4}$ inches. Leather shoulder strap with two snaps included 1.50
- Note Tablets and Herbariums on page 41.



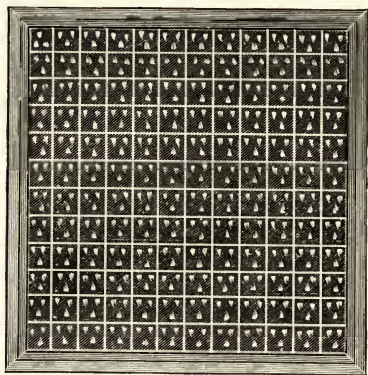
No. 9302.

9302. **Germinating Box,** Ganong pattern, for sprouting and for observing root growths. Light, water-proofed wooden box with inclined glass front. Each55
9301. **Germinating Box,** for showing proper depth to plant seeds (from Farmers' Bulletin No. 218). Substantially made of metal with glass front and back 3.35



No. 9301.

- See new Germinating Bed on page 91.
8016. **Sheet Cork,** for lining insect boxes and cabinets. 10 x 30 cm., 5 mm. thick; X quality, per dozen sheets. 1.44
8018. **Insect Pins,** white with round heads, very stiff with sharp points, sizes 0, 1, 2, 3, 4, 5, 6, per 100 of a size, \$0.13; per thousand. 1.00
8020. **Insect Pins,** black with round yellow heads, very stiff with sharp points. Sizes 00 or 0, per 100 of a size, \$0.17; per 1000. 1.45
8022. **Insect Pins,** same as No. 8020. Sizes 1, 2, 3, 4, 5 or 6, per 100 of a size, \$0.15; per 1000. 1.28
8025. **Pith,** for cutting sections, best imported, per package10



No. 9303.

9303. **Germinating Tray**, 25 x 25 x 2 1/4 inches deep, for testing fertility of corn and other grains. This tray is substantially made of wood, is water-proofed and will not warp. A frame which fits into the tray is divided into 144 squares which may be numbered if desired. Each \$ 4.50

9018. **Grain Container**, of heavy galvanized iron, with handles and cover; will hold half-bushel. Each 1.00

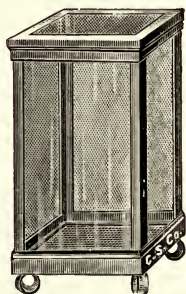
9307. **Sprouting Apparatus** (Schoenjahn's patent), for quickly determining the percentage sprouting value of barley, showing its malting quality. Equally efficient in showing sprouting value of all grains. This apparatus is simple and exceedingly practical. Complete with directions.... 6.65

9309. **Sprinkler, Rubber**, bulb of extra quality. We furnish only the large size, which is the most convenient size for all round use. Straight neck. Each 1.00

9311. **Sprinkler, Rubber**, same as above but bent neck. Each 1.10

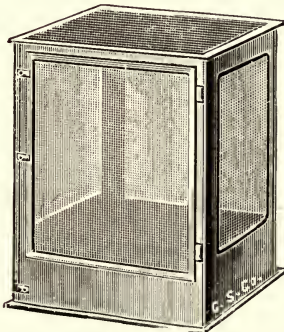


No. 9309.

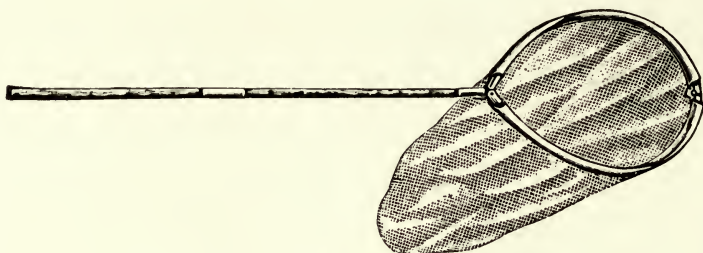


No. 9701.

9701. **Breeding Cage**, of zinc, glass front top, bottom and sides of wire gauze for ventilation; top and bottom removable. Size 5 1/2 x 5 1/2 x 10 inches high 3.35
9703. **Tray** of galvanized iron, water tight, for use with No. 9701 Breeding Cage for aquatic insects. Tray only..... .45
9705. **Breeding Cage**, all metal, non-corrosive, folding, easily adjusted. Top and sides of wire gauze for ventilation. Size 12 x 12 x 16 inches high 3.35

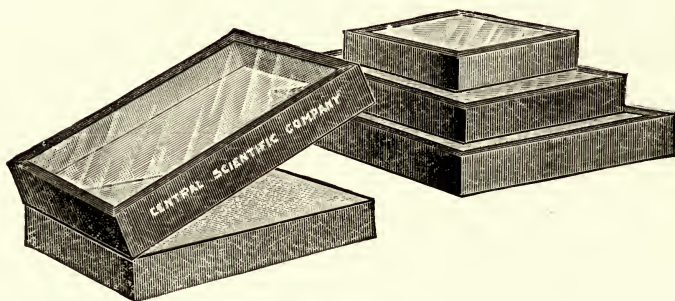


No. 9705.



No. 9709.

9707. **Insect Net**, student's form, good quality. Consists of seamless net bag with 42-inch hardwood handle with ferrule, collapsible.... \$ 1.65
9709. **Insect Net**, folding. Consists of seamless net bag, 18x25 inches, with light, strong, collapsing, tempered steel ring and a jointed 48-inch staff, put up in a partitioned cloth bag. This is the best net for general field use 2.50



No. 9781.

9781. **Specimen Mount**, Riker's, suitable for mounting insects, butterflies, fungi, shells, etc., or thick bulbs or plants too large for the Botanical Mounts, No. 9782.

These mounts will be found indispensable to collectors in preserving their specimens. They have the following advantages over the cumbersome and expensive cases with pin mounts: They preserve specimens from destroying insects and from sudden jars; occupy less space and are one-eighth as heavy; permit examination and changing of specimens at will, permit of life histories of nearly all species, and can be filed away in cabinets. Complete in black binding ready for collectors' use.

| | | | | | | |
|-----------------|-----------------|-------|-------|---------------|--------|---------|
| Size, inches | 2 1/2 x 3 | 4 x 5 | 5 x 6 | 6 1/2 x 8 1/2 | 8 x 12 | 12 x 16 |
| Each, net. |12 | .15 | .19 | .23 | .40 | .80 |
| Per dozen, net. | 1.35 | 1.70 | 2.00 | 2.50 | 4.50 | 9.00 |

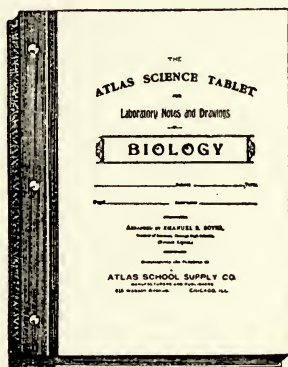
9782. **Botanical Mount**, Riker's, suitable for mounting any botanical specimen. The mount consists of two parts—a thin plate of photographic glass to which narrow flaps of linen morocco paper are neatly fastened, and a card-board back to which is glued a thin layer of sterilized surgical cotton in which the specimens are imbedded.

| | | | | | |
|--------------|-------|-------|---------------|--------|---------|
| Size, inches | ..... | 5 x 6 | 6 1/2 x 8 1/2 | 8 x 12 | 12 x 16 |
| Each, net. | ..... | .19 | .23 | .40 | .80 |

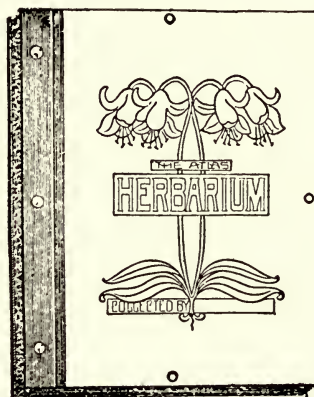
THE ATLAS SERIES OF SCIENCE TABLETS

FOR LABORATORY NOTES AND DRAWINGS.

These tablets consist of several tablets and covers, uniform in size ($7\frac{3}{4} \times 9\frac{3}{4}$ inches) and perforated, specially arranged for laboratory use.



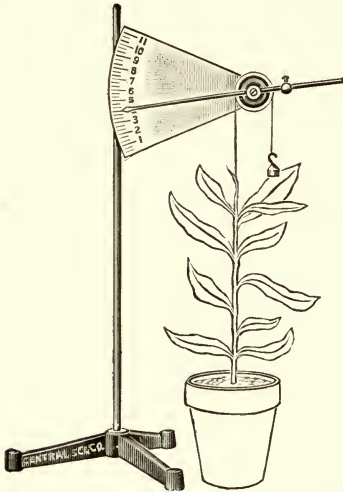
No. 6925.



No. 6950.

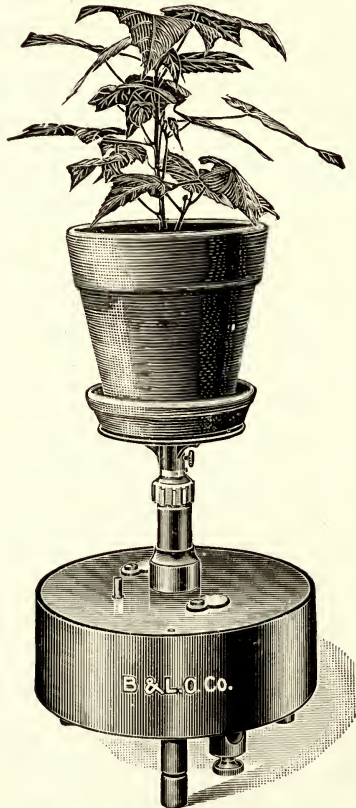
Prices Net.

- | | | |
|---|---|---------|
| 6920. | Drawing Tablet, containing 30 sheets of specially prepared, high grade drawing paper, with perforations and marginal ruling.... | \$0.14 |
| 6921. | Note Tablet, containing 30 sheets of extra quality ruled paper, with perforations and marginal ruling..... | .10 1/2 |
| 6922. | Covers. Set for binding, including front and back cover boards and cloth hinge, perforated, lace fasteners; with instructions..... | .07 |
| N. B.—In ordering covers separately, specify what tablet they are for (No. 6925-6928). | | |
| Note.—The following tablets are uniform in make-up, consisting of a set of covers (No. 6922) and one each drawing tablet (No. 6920) and note tablet (No. 6921). | | |
| 6925. | Biology Tablet, complete..... | .28 |
| 6926. | Botany Tablet, complete..... | .28 |
| 6927. | Zoology Tablet, complete..... | .28 |
| 6928. | Physiology Tablet, complete..... | .28 |
| Note.—We can also supply the following Special Tablets, which can be substituted for Nos. 6920 or 6921, if desired. | | |
| 6935. | Drawing Tablet, containing 30 sheets of high grade ledger paper for pen and ink drawing, with marginal ruling, perforated to fit covers | .14 |
| 6936. | Note Tablet, containing 30 sheets of extra quality unruled paper, perforated to fit covers..... | .10 1/2 |
| 6950. | Herbarium. This is made in two sizes, $7\frac{3}{4} \times 9\frac{3}{4}$ inches, and 11×17 inches, uniform in design with the Atlas Science Tablets. The portfolio form permits the specimens to be mounted scientifically according to the genus and species to which they belong. The plan also permits adding to or removing from the collection at any time. | |
| Hints on collecting, pressing and mounting specimens are found on inside cover pages. Each sheet contains a legend for classification. For 50 specimens, $7\frac{3}{4} \times 9\frac{3}{4}$ inches, with index..... | | |
| 6950A. | Covers only, per set..... | .10 |
| 6950B. | Mounting Sheets only, per 100..... | .50 |
| 6951. | Herbarium, same as No. 6950, size 11×17 inches, for 50 specimens, with index..... | .52 |
| 6951A. | Covers only, per set..... | .20 |
| 6951B. | Mounting Sheets only, per 100..... | 1.00 |
| 6955. | Plant Analysis Blanks, $7\frac{3}{4} \times 9\frac{3}{4}$ inches, special printed blanks giving complete analysis for Botany work; per envelope of 20 sheets | .07 |



No. 8027.

8027. **Auxanometer.** This is a very simple and practical apparatus for measuring plant growth. A silk thread attached to the plant, passes over a pulley with which it is held in close contact by a weight. This pulley moves freely and the pointer attached to it is provided with a counterbalance. The scale is accurately divided, each division representing a growth of .01 inch, and may be placed at any desired height on the support rod \$ 3.50

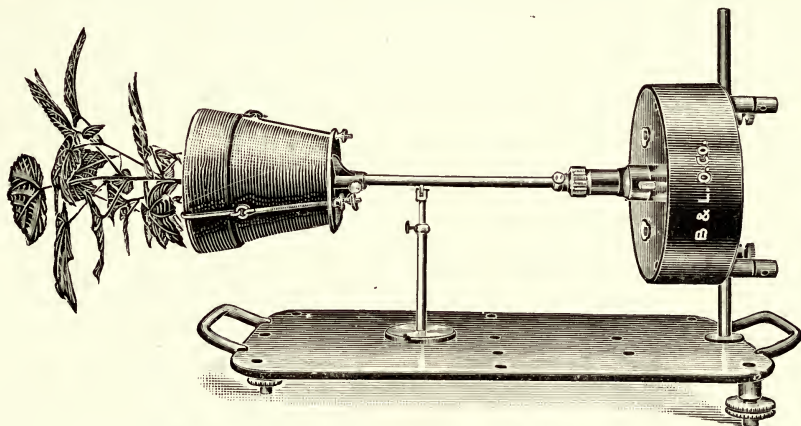


No. 8029 CLINOSTAT (vertical position.)

8029. **Clinostat.** The most essential single piece of apparatus for the laboratory of plant physiology is, doubtless, a clinostat. This instrument has been designed primarily for educational demonstration but it is available for investigation involving plants of

moderate weight where great precision of revolution is not required. It consists essentially of the works of a powerful eight-day clock, geared to a revolution in fifteen minutes (this being the only speed required for educational demonstration and for most investigation) and enclosed in a practically dust and moisture-proof case, 16 cm. in diameter. It can be used in any position whatever, as shown by the accompanying figures. It has been greatly improved over the original form (described in the *Botanical Gazette* for April, 1904) by the addition of a ball-bearing shaft which takes the strain from the works, while friction-rollers have been added to the spindle-rod support. The works are started and stopped by a cylindrical nut projecting from the upper surface. It is to be wound, and not too tightly, once in two days, which may be accomplished without disturbing the plant. Properly used it will carry a 4-inch or smaller pot horizontally, or a larger size vertically. As with all clinostats, however, it revolves with the greater evenness the smaller the weight it has to carry, and consequently the smallest pots allowed by the subject under study should be used. The size with which the instrument works best is the "three-inch," this size, however, being larger than commonly supposed, since the measurements of pots are all internal.

In using the clinostat with plant vertical, it should be leveled by means of the extensible legs; a 4-inch flower-pot saucer should be stood on the disk, into the rim of which it exactly fits, to catch the drip from the pot, and the plant should be stood exactly in its center. The arrangement is shown in the first illustration.



No. 8029. CLINOSTAT (horizontal position).

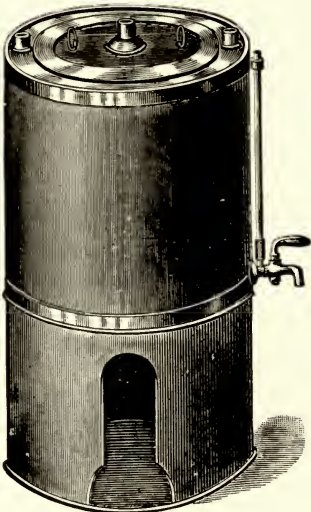
In using the clinostat with plant horizontal, the general arrangement as shown above, should be followed. Any upright support may be used, but it must be firm enough to hold the clinostat in a truly vertical position. The weight of the plant must be centered in order that the instrument may be able to keep the revolution uniform throughout. This adjustment is effected thus: The pot is attached to the disk by means of the screw-rods, which, however, are not tightened. The plant with the spindle-arm is then placed in position, resting on the extensible spindle-rod support as shown in the figure, but the screw attaching the spindle-arm to the clockwork is left loose. The plant is then given a twirl with the hand, and after turning once or twice comes to a rest with its heaviest side down. The pot is now pushed on the disk from the heavy side and twirled again, and the process is repeated until after a few trials the plant comes to rest indifferently in any position. Then the screw-rods are tightened and finally the screw connecting the spindle-arm and works, and the experiment may begin. Care must be taken never to allow the weight of the plant to be unsupported, else the spindle-rod may be greatly bent and damaged. Further, the adjustable support must be neither too high nor too low, else the spindle-rod may "bind" and refuse to turn.

For many purposes, especially for the study of geotropism of roots, etc., it is needful to revolve the disk within a dark moist chamber. This can best be effected by carrying the spindle-rod through a hole in the side of a large flower-pot, which, set in a saucer of water and covered by another saucer, makes an almost ideal moist chamber. The hole is readily drilled in the pot by use of a file set in a carpenter's brace.

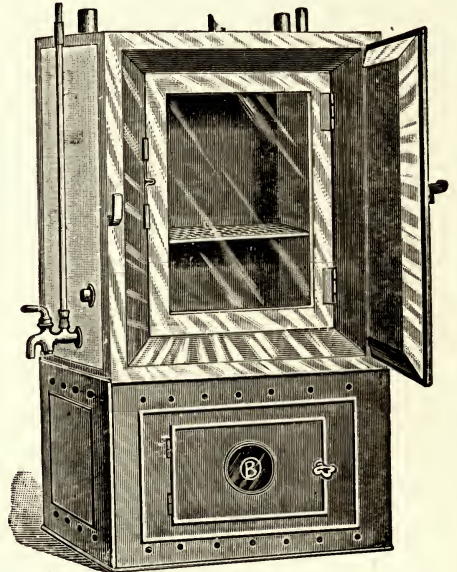
In using the instrument the following precautions should be observed: No water should be allowed under any circumstances to get into the works, and the instrument should be exposed to as little moisture as possible. It should be kept closed from the dust as much as possible. Sudden or extreme strains on the works must be avoided. Like all clockwork it must be cleaned and oiled at intervals, the length of which depends upon the amount of use.

8029. Clinostat \$ 25.00

BACTERIOLOGICAL INCUBATORS.

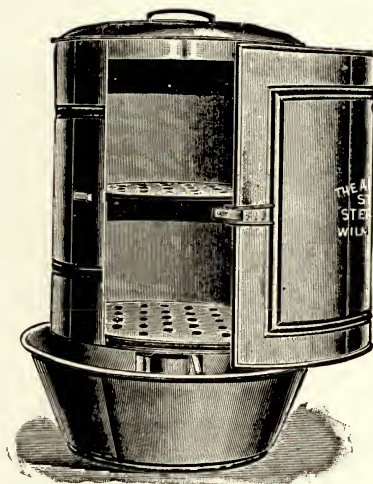


No. 8030.



No. 8032-8034.

8030. **Incubator.** This is suitable for laboratory workers who desire to make only a small number of cultures at a time. It is made of polished copper, having a 2-inch water space, and is covered with an insulating material. This incubator is provided with water-gauge and stop-cock, and also has a perforated tray. The plate-glass in top of incubator prevents sudden change in temperature when opening the lid to examine the culture.
- Inside measurement 8x9 inches, outside measurement 12x12 inches. The base is made of sheet iron and is 8 inches high. Complete with No. 4629 Bunsen Burner, special Thermometer, No. 8100 Thermostat and Asbestos Mat..... Net \$ 21.00
8032. **Laboratory Incubator,** three walls, made of highly polished copper with conical bottom, having both air and water space, the outer surface being covered with insulating material to insure an even temperature, and the exposed copper parts lacquered to prevent tarnishing.
- It is provided with two doors, the inner one of beveled glass which permits observation of cultures without disturbing the temperature. The outer door, of copper, double wall, is prismatic, properly fitted, with felt buffers to insure perfect fit and close contact.
- There are tubulations for thermo-regulator and thermometer and for filling water space; these are properly marked. A metal tube passes through the air space for connecting with gas supply.
- The control of temperature in the air space is effected by a ventilator on top of the oven.
- The Incubator is supported on a sheet iron base, 10 inches high, finished in dull black, with a door, having a mica glass for observation of the flame. Each incubator is complete with No. 8070 Koch Burner, special Thermometer, and No. 8100 Thermostat.
- Inside dimensions, 7 inches high, 7 inches wide, 9 inches deep. Extreme outside dimensions, 24 inches high, 11½ inches wide, 11 inches deep Net 46.00
8034. **Laboratory Incubator.** Same style as No. 8032, but larger. Inside dimensions, 12 inches high, 12 inches wide, 9 inches deep. Extreme outside dimensions, 26 inches high, 14 inches wide, 14 in. deep. Net 61.00

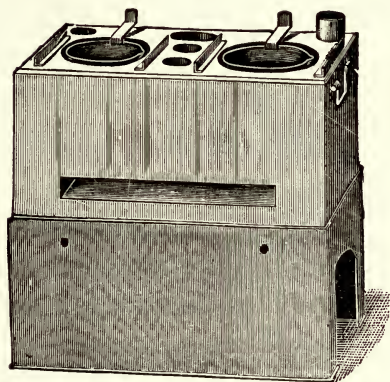


No. 8042-48.

Sterilizer, Arnold's Steam. These Sterilizers are inexpensive and are well known for their compactness and for their efficient economy. They maintain an unvarying temperature of 100° C. (212° F.) in all parts of the sterilizing chamber.

8042. Height 7 ¼ in. Diameter 8 ½ in.
Heavy tin, copper bottom. . . . Net \$ 4.00
8044. Height 11 ½ in. Diameter 10 ½ in.
Heavy tin, copper bottom Net 5.50
8046. Height 8 ½ in. Diameter 7 ¼ in.
All copper, polished Net 10.00
8048. Height 11 ½ in. Diameter 10 ½ in.
All copper, polished Net 15.00

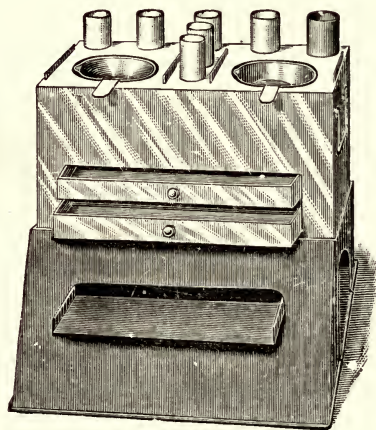
PARAFFINE BATHS.



No. 8050.

8050. **Paraffine Bath**, made of polished copper, 7 inches long, 3 ¾ inches wide, and 3 ½ inches deep, with extra sheet iron bottom and iron base, which is 5 inches high. It is provided with a space for heating slides, two nickel-plated cups, 2 ½ inches in diameter and 1 ½ inches deep, also tubulations for thermometer and gas regulator

7.50

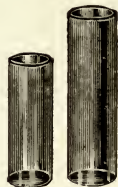


No. 8052.

8052. **Paraffine Bath**, made of polished copper, 8 inches long, 4 inches wide, and 4 inches deep, provided with an extra sheet-iron bottom, to prevent burning out. The sheet-iron base is 5 inches high. The bath has two nickel-plated cups, one shallow and one deep. The shallow cup is 2 ¼ inches in diameter and ¾ inch deep, watch glass shape, and the deep one is 2 ¼ inches in diameter and 1 ½ inches deep. It has two drawers to hold slides, also tubulations for thermometer and gas regulator and five test tubes.

12.00

MISCELLANEOUS SUPPLIES.

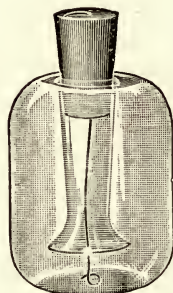


| No. 8056. | No. 8058. | No. 8060. | No. 8061. | No. 8062. | No. 8064. | No. 8065. |
|-----------|--|---|-----------|-----------|-----------|-----------|
| 8056. | Bottles, Flint, extra wide mouth for collecting insects. | | | | | |
| | Capacity, ounces | | | | 3 | 6 |
| | Price, per dozen | | | | \$0.40 | .60 |
| 8058. | Bottle, Balsam. | With glass balsam dropper and glass cap. Each | | | | |
| 8060. | Bottle, Balsam. | Wide mouth, glass cap and glass rod; 30cc. | | | | |
| 8061. | Bottle, Dropping. | With Barnes pipette stopper, square shape, 30cc. | | | | |
| | Each | | | | | .10 |
| 8062. | Bottle, Dropping. | Ground stopper, capped pipette; 15cc. | | | | |
| 8064. | Bottle, Dropping. | Ground stopper, bulb pipette; 30cc. | | | | |
| 8065. | Bottles, Collecting. | Round, straight wall, with cork. | | | | |
| | No. | 1 | 2 | 3 | 4 | 5 |
| | Height, mm. | 50 | 60 | 70 | 80 | 75 |
| | Diameter, mm. | 12 | 13 | 15 | 16 | 25 |
| | Capacity, cc. | 4 | 7 | 11 | 14 | 34 |
| | Per dozen | .20 | .24 | .30 | .35 | .60 |
| 8066 | Bottle, Cyanide, prepared, 4 oz. | | | | | .17 |

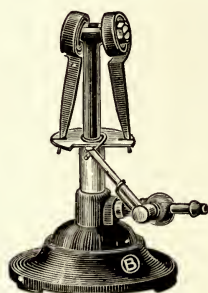
See page 73 for other Bottles.



No. 8067.

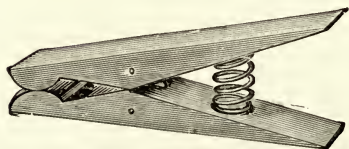


No. 8068.

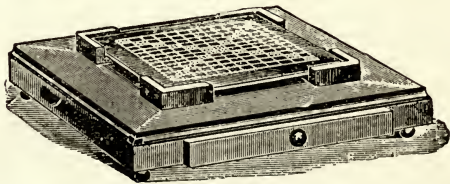


No. 8070.

| | | | |
|-------|---|---------|-------|
| 8067. | Bottles, Insect. Bent neck | 1/2 oz. | 2 oz. |
| | Per dozen | .55 | 1.20 |
| 8068. | Bottle, Immersion Oil. Special bottle and dropper for immersion oil, unspillable | | .50 |
| 8069. | Immersion Oil, Cedar (Dr. Grueblers'), per 10 gram vial | | .30 |
| 8070. | Burner, Koch's Safety, with automatic stop-cock to close off the gas when flame has gone out; on iron base; height, 5 inches. | | 4.50 |



No. 8074.



No. 8078.

| | | |
|-------|---|------|
| 8074. | Clips, spring, wood, per dozen | .30 |
| 8078. | Counting Apparatus, Wolffhuegel's. For counting colonies of bacteria. Oak base; large drawer; background plates, black and white; surface of plates covered by rulings 12cm. square, each | 5.00 |



No. 8080.



No. 8082.



No. 8084.



No. 8086.

8080. Dishes, Petri or Esmarch's double dishes.

| | | | | | |
|----------------------|--------|-----|-----|-----|-----|
| Diameter, mm. | 50 | 80 | 100 | 120 | 150 |
| High form, each..... | \$0.15 | .20 | .25 | .35 | .50 |

8082. Dishes, Petri. Double dishes, low form; diameter 100mm., each.. \$ 0.25

8084. Dishes, Preparation.

| | | | |
|--------------------|-----|-----|-----|
| Diameter, mm. | 40 | 53 | 64 |
| Price, each | .15 | .20 | .25 |

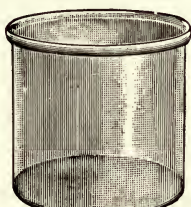
8086. Dishes, Stender. Straight sides; grooved top accurately ground which makes the dish air tight. No.....

| | | | | |
|--------------------|-----|-----|-----|-----|
| Diameter, mm. | 0 | 1 | 2 | 3 |
| Height, mm. | 36 | 50 | 60 | 60 |
| Each | .12 | .18 | .19 | .22 |

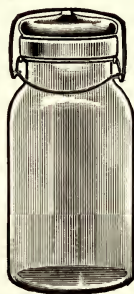
Crystallizing and Evaporating Dishes listed on page 78.



No. 8088.



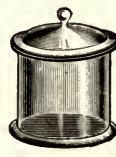
No. 8090.



No. 8091.



No. 8092.



No. 8093.

8088. Jars, Battery. Round with straight sides.

| | | | | | |
|--------------------|-----|-----|-----|-----|------|
| Diameter, mm. | 100 | 100 | 125 | 150 | 225 |
| Height, mm. | 100 | 125 | 175 | 200 | 315 |
| Each | .25 | .25 | .40 | .55 | 1.35 |

8090. Aquaria.

| | | | | |
|----------------|--------|--------|--------|--------|
| Capacity | 1 gal. | 2 gal. | 3 gal. | 5 gal. |
| Price | 1.00 | 1.50 | 2.25 | 3.30 |

See page 50 for Large Aquaria.

8091. Jars, "Seal Fast." Per dozen, pint, 1.50, quart.....

1.65

8091A. Jars, Mason's. Per dozen, pint, .75, quart, .85, 2 quart.....

1.10

8092. Jars, Specimen. Museum. Mouth same size as body; rubber packing and metal clamp.

| | | | | | |
|-------------------------|------|------|------|-----|------|
| Capacity, liters | 0.25 | 0.50 | 1.25 | 2 | 3 |
| Height, mm. | 100 | 200 | 200 | 300 | 450 |
| Width of mouth, mm..... | 57 | 57 | 88 | 88 | 88 |
| Each | .45 | .50 | .85 | .90 | 1.15 |

| | | | | | | |
|-------------------------|------|------|------|------|------|------|
| Capacity, liters | 2.75 | 4 | 6 | 9 | 14 | 18 |
| Height, mm. | 200 | 300 | 450 | 300 | 450 | 600 |
| Width of mouth, mm..... | 125 | 125 | 125 | 190 | 190 | 190 |
| Each | 1.30 | 1.45 | 1.80 | 2.50 | 3.00 | 3.50 |

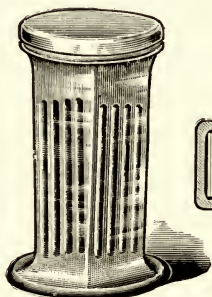
8093. Jars, Specimen. White glass; carefully ground cover with knob.

| | | | |
|--------------------|------|------|------|
| Diameter, mm. | 100 | 180 | 220 |
| Height, mm. | 130 | 200 | 220 |
| Each | 1.00 | 2.75 | 4.00 |

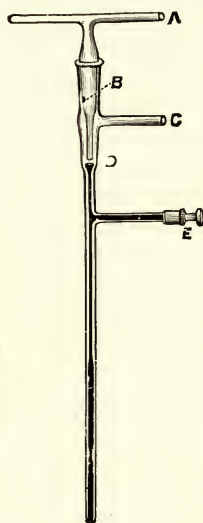
See page 49 for other Specimen Jars.



No. 8095.



No. 8096.



No. 8100.



No. 8102

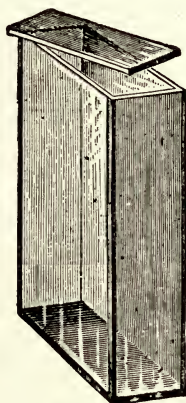


No. 8128.

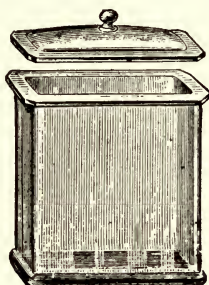
8095. **Calcutt's Jars.** This jar is the best medium priced preservation jar on the market. Made entirely of glass, so there is no danger of corrosion. Easy to seal as a half turn of the cover renders the jar air tight.

| | | |
|------------------------|--------|------|
| Capacity, cc. | 500 | 1000 |
| Price, each | \$0.15 | .20 |
| Price, per dozen | 1.50 | 2.00 |

8096. **Jar, Staining, Coplin's;** for ten slides, glass lid..... \$.50
8100. **Thermo-Regulator.** This improved Reichert Gas Regulator secures constant temperature at any desired point from 1° Cent. to near the boiling point of mercury. Especially adapted for water baths, drying ovens, sterilizers, etc. Each..... 2.00
8101. **Watch Glasses, light, flat bottom, diameter 50mm.;** per dozen.... .55
8102. **Watch Glasses, Syracuse, outside diameter 65mm.;** inside diameter 50mm.; plain, per dozen60
8103. **Watch Glasses, Syracuse, same as No. 8102, with ground beveled surface, per dozen90**
8164. **Bands, Rubber.** ¼ pound, assorted, in box..... 2.00
8106. **Bristol Board, for drawing, best quality, per dozen sheets, 13x16 in. .30**
8108. **Cotton, Absorbent (best), per pound..... .50**
8110. **Fingers, Rubber, men's, per dozen..... 1.00**
8112. **Fingers, Rubber, women's, per dozen..... .75**
8118. **Paper, Lens. Japanese. For cleaning lenses, per package..... .25**
8119. **Pencils, Drawing. Faber's 4H, per dozen..... 1.25**
8120. **Pencils, Drawing. Faber's 6H, per dozen..... 1.25**
8128. **Tumblers, Jelly, with cover, 200cc. capacity, per dozen..... .55**



No. 8160.



No. 8162.



No. 8163.

8160. **Specimen Boxes**, of clear white glass, rectangular shape, with well shaped corners. Cover ground on. Very useful for permanent mounts or anatomical specimens.

| | | | |
|-------------------|--------|-----|------|
| Height, mm. | 100 | 150 | 200 |
| Length, mm. | 50 | 105 | 60 |
| Width, mm. | 25 | 50 | 40 |
| Price, each | \$0.50 | .95 | 1.00 |

8161. **Specimen Boxes**, same as above with side carefully ground and polished. The very best jar for permanent mounts. The polished, flat, ground side affords an undistorted view of the specimen which makes this jar especially valuable for exhibits of dissections, as every organ and vessel is shown in actual size and position. Extensively used in leading Museums and Universities.

| | | | | |
|-------------------|-----|------|------|------|
| Height, mm. | 100 | 150 | 200 | 260 |
| Length, mm. | 50 | 105 | 60 | 150 |
| Width, mm. | 25 | 50 | 40 | 80 |
| Price, each | .65 | 1.25 | 1.50 | 4.00 |

8162. **Specimen Jars**, of clear white glass, rectangular shape, with solid foot and large ground flange, ground-on cover with knob.

| | | | | |
|--------------------------|------|------|------|------|
| Height, inside, mm. | 120 | 200 | 250 | 350 |
| Length inside, mm. | 80 | 160 | 250 | 130 |
| Width inside, mm. | 20 | 45 | 120 | 120 |
| Price, each | 1.10 | 4.00 | 5.50 | 6.00 |

Note.—We carry all the above (Nos. 8160-8162) in stock, but can import them duty free for institutions of learning, provided not less than ten jars of one size are ordered.

8163. **Bell Jars, Double Wall**, ground glass stopper, after Prof. Sachs. For studying the effects of different colored light rays on plant life.

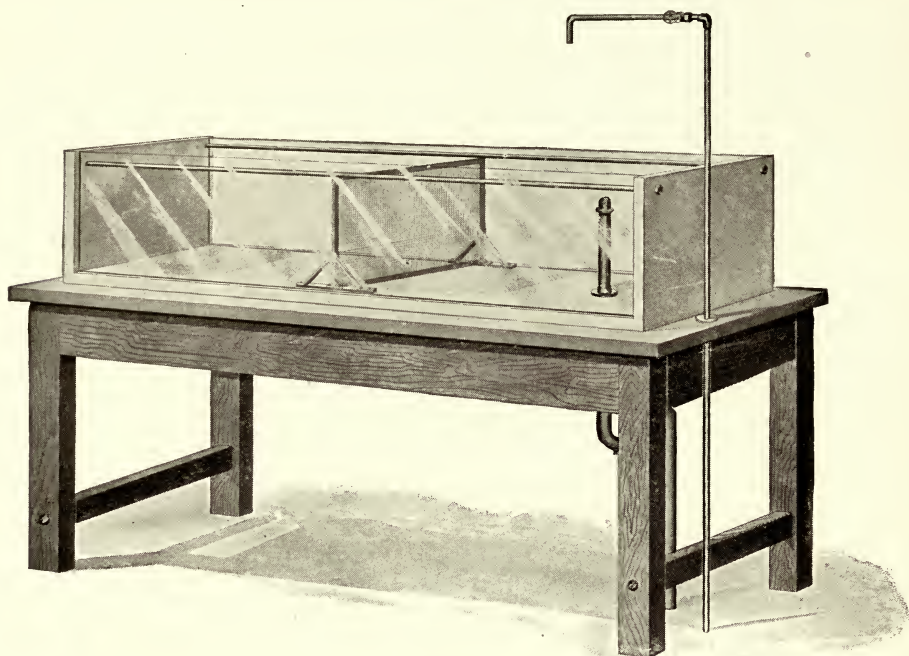
| | | |
|---------------------------|------|------|
| Height inside, mm. | 250 | 400 |
| Diameter inside, mm. | 180 | 150 |
| Price, each | 5.50 | 6.00 |



No. 8165.

8165. **Slide Trays**, of clear white glass with polished edges, useful in cleaning microscope slides. Dimensions, 115mm. long, 50mm. wide, and 50 mm. deep, inside measurements. Each.....

.50



No. 8169.
AQUARIUM.

This aquarium is of good design and has been installed in many laboratories. Several aquaria of similar design are now in use in the laboratories of the University of Chicago.

The ends and bottom are made of Alberene stone with front and back of clear plate glass. The glass is set in the stone and cemented water tight. A brass rod along the top edge of the glass adds to its rigidity. The plumbing fixtures supplied consist of a vertical supply pipe of brass with one outlet, controlled by a valve. One vertical overflow of brass with connections for waste pipe are also included. One wire gauze partition of brass is supplied and can be used to divide the aquarium into two sections.

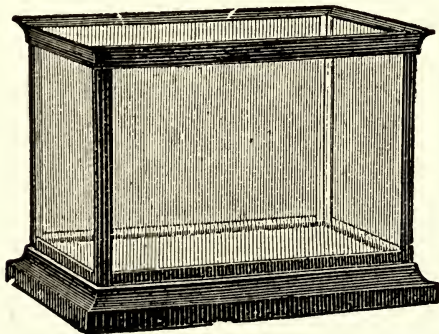
Aquarium measure, outside 50 in. x 24 in. x 15 in. deep. Table top measure, 58 in. x 32 in. x 30 in. high. The top of the table is finished black, acid proof. Weight of table, crated, 180 lbs.; weight of aquarium, 600 lbs.; total weight, 780 lbs.

8169. Tank and Table.....F. O. B. Factory \$ 76.00

8169A. Tank only as described.....F. O. B. Factory 61.00

8169B. Table onlyF. O. B. Factory 15.00

Tanks of special size, and with or without plumbing, quoted on application.



No. 8170-72.

Aquaria. Heavy tin frame, green enamel with gold stripe, thick glass.

| No. | L'gth. in. | Wi'th., in. | H'ght., in. | Capac., gals. | Price. |
|-------|---------------|----------------|----------------|------------------|--------|
| 8170. | 10 ½ | 6 ½ | 6 ½ | 1 ½ | \$2.00 |
| 8171. | 13 | 8 | 8 | 4 | 3.00 |
| 8172. | 16 | 10 | 10 | 7 | 4.50 |
| 8173. | 20 | 12 | 12 | 13 | 8.00 |

Small Glass Aquaria on page 47.

CHARTS AND SPECIMENS.

It is an established fact that different branches of Natural Science cannot properly be taught without the assistance of living and preserved specimens and enlarged illustrations demonstrating Development, Anatomy, Biology, etc., of typical species.

8175. Botanical Charts. A series of six charts for beginners 34x28 inches, in natural colors, mounted on cloth and common rollers, per chart \$ 1.70

- Chart I. **The different kinds of common Roots.**
 " II. **The shape and different habits of growth of common Stem.**
 " III-IV. **Leaves, illustrated morphologically.**
 " V. **Typical Flowers.**
 " VI. **Fruits and Seeds of various types.**

8175B. Botanical Charts. Same as No. 8175, but mounted on spring roller in veneer case, per chart..... 3.40

8175C. Botanical Charts. Complete set of above six charts on spring rollers in one case..... 16.90

8176. Botanical Charts. Elementary Anatomical Botany, illustrating the structural character of plants as seen under the compound microscope. This set will take the place of more expensive and less convenient photomicrographs, which require a projection outfit and darkened room to demonstrate; mounted on cloth and common rollers, per chart 1.70

- Chart I. **The Root System and its parts, as seen in different sections.**
 " II. **The Stem and Bud in longitudinal and transverse sections.**
 " III. **The Leaf and Leaf Stalk.**
 " IV. **The Flower as a whole.**
 " V. **The Flower in its parts.**
 " VI. **The Fruit, Seed and Embryo.**

8176B. Botanical Charts. Same as No. 8176, but mounted on spring roller in veneer case, per chart..... 3.40

8176C. Botanical Charts. Complete set of above six charts on spring rollers in one case..... 16.90

8177. Botanical Charts. A series of four charts 50 x 42 inches, adapted for advanced classes in high schools and colleges, mounted on cloth and common rollers, with manual, per chart..... 4.70

- Chart I. **Organs of Tissues, Plants, Root and Stem, 36 illustrations.**
 " II. **Leaves and Their Modifications, 36 illustrations.**
 " III. **Inflorescence, Whorls of the Flower, 38 illustrations.**
 " IV. **Pistil, Ovule, Fruit, Seed Organs of Flowerless Plants, 44 illustrations.**

8177B. Botanical Charts. Same as No. 8177, but mounted on spring roller in veneer case with manual, per chart..... 6.65

8177C. Botanical Charts. Complete set of four charts on spring rollers, in case, with manual..... 25.00

NEW BOTANICAL ARTPLATES.



No. 8190.
Plate 25.

8190. **Botanical Artplates.** A high-class series of fine and exceptionally clear and distinct color-prints on black ground for botany lessons. Each plate not only shows a complete specimen of each subject, but also parts of its organism, sections, etc. Lithographed on heavy paper 30x40 inches.

Mounted on linen and common rollers..... Each, Net \$ 2.00

- | | |
|---------------------------|--------------------------|
| 1. Primrose. | 11. Willow. |
| 2. Pea. | 12. Garden Tulip. |
| 3. Horse Chestnut. | 13. Pear Tree. |
| 4. Wild Strawberry. | 14. White Dead Nettle. |
| 5. Cuckoo Flower. | 15. Pansy. |
| 6. Buttercup. | 16. Corn Cockle. |
| 7. Red Poppy. | 17. Mistletoe. |
| 8. Potato. | 18. Linden. |
| 9. Bindweed. | 19. Carrot. |
| 10. Rye. | 20. Sunflower. |
| 21. Vine. | 31. Cusc Epithymum. |
| 22. Hazel Tree. | 32. Bird's Foot Trefoil. |
| 23. Salep Orchid. | 33. Sage. |
| 24. Fir Tree. | 34. Cornflower. |
| 25. Common Spotted Fern. | 35. Flaxweed. |
| 26. Large Hair Moss. | 36. Evening Primrose. |
| 27. Champignon. | 37. Sundew. |
| 28. Striated Wall Lichen. | 38. Snakeweed. |
| 29. Headed Mold. | 39. Ergot. |
| 30. Freshwater Algae. | 40. Yeast-plant. |

BOTANICAL PICTURE SERIES.



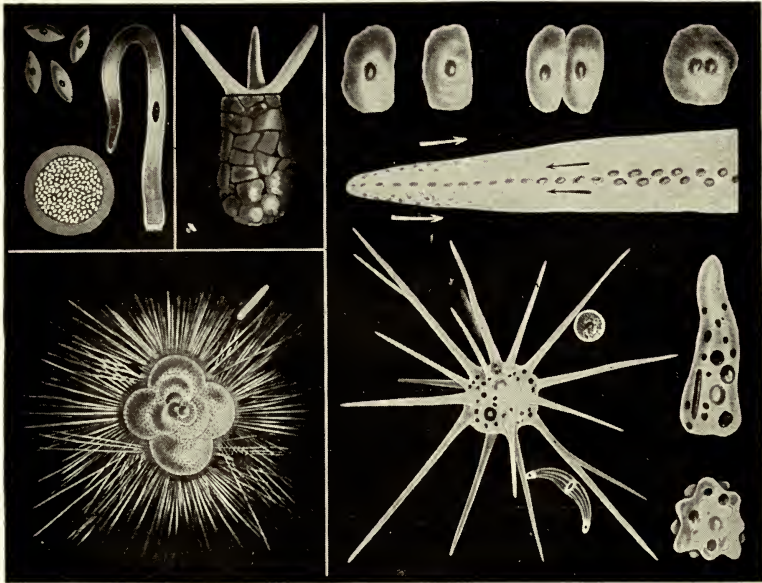
No. 8192.
Chart 10.

8192. **Botanical Charts.** A collection of artistic color-reproductions of Botanical Subjects as an aid to the teaching of Botany. Lithographed on heavy paper 43x51 inches.

Mounted on linen and common rollers.....Each, Net \$ 3.00

- | | |
|-----------------------|----------------|
| 1. Tulip. | 7. Mushroom. |
| 2. White Dead Nettle. | 8. Mildew. |
| 3. Fir Tree. | 9. Tansy. |
| 4. Bellflower | 10. Wild Rose. |
| 5. Spoonwort. | 11. Seaweed. |
| 6. Windflower. | |

NEW ZOOLOGICAL ART PLATES.



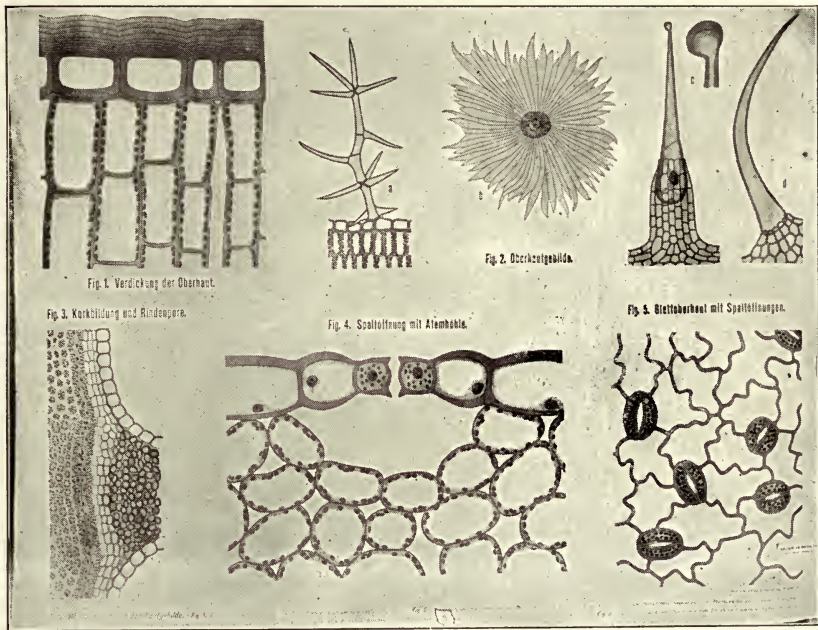
No. 8194.
Plate 30.

8194. **Zoological Artplates.** A high-class series of fine and exceptionally clear and distinct color-prints on black ground for Zoology lessons. Each plate not only shows a complete specimen of each subject, but also parts of its organism, sections, etc. Lithographed on heavy paper 30x40 inches.

Mounted on linen and common rollers..... Each, Net \$ 2.00

- | | |
|---------------------------|-------------------------|
| 1. Domestic Cat. | 21. Crested Salamander. |
| 2. Sheep. | 22. Carp. |
| 3. Hare. | 23. Housefly. |
| 4. Chaffinch. | 24. Mole-cricket. |
| 5. Lizard. | 25. Cyclops. |
| 6. Perch. | 26. Starfish. |
| 7. Common Frog. | 27. Tapeworm. |
| 8. Snail. | 28. Coral. |
| 9. Cockchafer. | 29. Infusoria. |
| 10. Garden Spider. | 30. Protozoa. |
| 11. Goose. | 31. Hedgehog. |
| 12. Adder and Viper. | 32. Trichina. |
| 13. European Mud Turtle. | 33. Leech. |
| 14. Fresh-water Mussel. | 34. Cuttlefish. |
| 15. Bee. | 35. Shark. |
| 16. Cabbage Butterfly I. | |
| 17. Cabbage Butterfly II. | |
| 18. Cray-Fish. | |
| 19. Earthworm. | |
| 20. Fresh-water Polypus. | |

BOTANICAL ANATOMY DIAGRAMS.



No. 8196.

Chart 3.

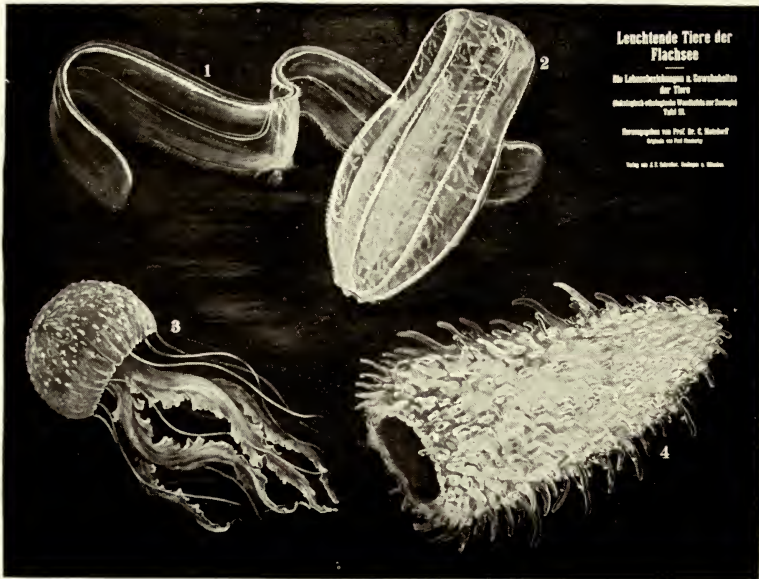
8196. **Botanical Charts.** A high-class series of colored reproductions of microscopical botanical structures for Botany lessons. Lithographed on heavy paper, 27x36 inches.

Complete set mounted on linen and common rollers.....Net \$ 9.00

SOLD ONLY IN SETS.

- | | |
|---|--|
| 1. The cell and its parts. | 4. The vessels of the vegetable body. |
| 2. The constituent parts of the cell and cell products. | 5. The evolutionary stages of trees and composition of the wood. |
| 3. Epidermis. | 6. The cellular tissue of assimilation and elimination of matter, etc. |

LIFE CONDITIONS AND HABITS OF ANIMALS.



No. 8198.
Plate III.

8198. **Zoological Charts.** Four highly interesting and most instructive plates executed in rich colors as an aid to the teaching of Zoology. Lithographed on heavy paper, 36x48 inches.

Mounted on linen and common rollers, per chart.....Net \$ 2.50

Plate I.

Mimicry in Animals.

(Imitation of Leaves, Bark and Fruit.)

1. Vanessa C—Album.
2. The same on dry leaves of a poplar.
3. Kalliminachis.
4. The same on brown leaves.
5. Calocampa vetusta.
6. The same within decaying bark.
7. Cionus scrophulariae.
8. Cocoons of the same between the fruit of Scrophularia nodosa.

Plate II.

Mimicry in Animals.

(Imitation of Lichens and Dry Branches.)

1. Moma orion.
2. The same on lichen-grown bark of a tree.

3. Caterpillar of Moma orion.
4. Caterpillar.
5. Boarmia lichenaria.
6. Epeira paroula.
7. Ancyronatur tribulus.
8. The same on lichen-grown branch.
9. Palophus centaurus.

Plate III.

Phosphorescent Animals of the Sea.

Plate IV.

Community of Animal and Plant Life.

The chapter, which is treated by plates III and IV, comprises various modes of adaptability of animals to lifeless nature, their relationship to the young and grown up of their own and other species, to plants, etc.

ZOOLOGICAL SKELETONS.

CLEANED, BLEACHED AND MOUNTED, FIRST-CLASS IN EVERY RESPECT.

| | Prices Net. |
|---|------------------|
| 8200A. <i>Simia satyrus</i> , orang-outang..... | \$225.00 |
| 8200B. <i>Simia troglodytes</i> , chimpanzee..... | 360.00 |
| 8200C. <i>Cercopithecus sabaeus</i> , green monkey..... | 16.00 |
| 8200D. <i>Lemur macaco</i> , macaque..... | 20.00 |
| 8200E. <i>Vespertilio murinus</i> , common bat..... | 3.25 |
| 8200F. <i>Felis leo</i> , lion..... | \$45.00 to 95.00 |
| 8200G. <i>Felis domestica</i> , house cat..... | 7.50 |
| 8200H. <i>Canis familiaris</i> , dog..... | \$10.00 to 25.00 |
| 8200I. <i>Ursus arctos</i> , brown bear..... | 40.00 to 100.00 |
| 8200J. <i>Talpa europaea</i> , common mole..... | 1.75 |
| 8200K. <i>Sciurus vulgaris</i> (<i>carolinensis</i>), common squirrel..... | 4.50 |
| 8200L. <i>Castor fiber</i> , beaver..... | 32.00 |
| 8200M. <i>Cavia cobaya</i> , guinea pig..... | 8.00 |
| 8200N. <i>Lepus cuniculus</i> , rabbit..... | 8.00 |
| 8200O. <i>Equus caballus</i> , horse..... | 85.00 |
| 8200P. <i>Bos taurus</i> , ox..... | 75.00 |
| 8200Q. <i>Ovis aries</i> , sheep..... | 35.00 |
| 8200R. <i>Sus domesticus</i> , pig..... | 45.00 |
| 8200S. <i>Phocaena communis</i> , porpoise..... | 30.00 |
| 8200T. <i>Halmaturus giganteus</i> , kangaroo..... | 55.00 |
| 8200U. <i>Ornithorhynchus paradoxus</i> , duck-bill..... | 40.00 |
| | |
| 8201A. <i>Astur palumbarius</i> , goshawk..... | 7.25 |
| 8201B. <i>Strix flammea</i> , screech owl..... | 5.60 |
| 8201C. <i>Bubo maximus</i> , eagle owl..... | 9.60 |
| 8201D. <i>Columbia livia</i> , pigeon..... | 4.00 |
| 8201E. <i>Gallus domesticus</i> , chicken..... | 6.00 |
| 8201F. <i>Carvus cornix</i> , hooded crow..... | 5.60 |
| | |
| 8202A. <i>Alligator mississippiensis</i> , alligator..... | \$25.00 to 50.00 |
| 8202B. <i>Testudo graeca</i> , tortoise..... | 5.00 |
| 8202C. <i>Lacerta viridis</i> , green lizard..... | 5.00 |
| 8202D. <i>Tropidonotus natrix</i> , grass snake..... | 7.50 |
| 8202E. <i>Pelias berus</i> , viper..... | 7.50 |
| | |
| 8203A. <i>Perca fluviatilis</i> , perch..... | 7.50 |
| 8203B. <i>Cyprinus carpio</i> , carp..... | 8.25 |
| 8203C. <i>Esox lucius</i> , pike..... | 7.50 |
| 8203D. <i>Rana esculenta</i> (<i>fortis</i>), common frog..... | 2.50 |
| 8203E. <i>Rana esculenta</i> , in glass case (glass on 4 sides), wire mounted.... | 4.00 |

ZOOLOGICAL PREPARATIONS.

These are made under the supervision of eminent German zoologists.

COMBINED PREPARATIONS.

Show the skeleton from one side and the mounted animal from the other side, thereby illustrating the relation of the skeleton to the other parts. Prepared dry under glass.

Prices Net.

| | |
|--|---------|
| 8205A. <i>Vespertilio noctula</i> or <i>specialis</i> , bat..... | \$ 6.50 |
| 8205B. <i>Sciurus vulgaris</i> , squirrel..... | 9.25 |
| 8205C. <i>Felis domestica</i> , house cat..... | 20.00 |
| 8205D. Same with organs of digestion and respiration..... | 30.00 |
| 8205E. <i>Columbia livia</i> , pigeon..... | 11.00 |
| 8205F. <i>Lacerta viridis</i> , green lizard..... | 10.00 |
| 8205G. <i>Tropidonotus natrix</i> , grass snake..... | 13.25 |
| 8205H. <i>Testudo graeca</i> , tortoise with ovaries..... | 11.00 |
| 8205J. <i>Rana esculenta</i> , frog..... | 5.00 |
| 8205K. <i>Cyprinus carpio</i> , carp..... | 8.25 |

SITUS, NERVE AND INJECTED PREPARATIONS.

The situs preparations demonstrate the situs viscera in natural position mounted in alcohol.

The nerve preparations show the brain, spinal marrow and all other nerves on the whole animal. Even in the smaller details the nerves are laid open.

The injected preparations illustrate the vascular system of the animal in natural color; the arteries in red, veins in blue and pulmonary system in white or light blue.

Prices Net. Duty Free.

| | A. | B. | C. |
|---|---------|---------|-----------|
| | Situs. | Nerve. | Injected. |
| 8206. <i>Felis domestica</i> , cat..... | \$17.00 | \$30.00 | \$18.00 |
| 8207. <i>Mus rattus</i> , rat..... | 5.75 | 10.00 | 7.00 |
| 8208. <i>Cavia cobaya</i> , guinea pig..... | 9.50 | 12.50 | 8.50 |
| 8209. <i>Columbia livia</i> , pigeon..... | 6.00 | 12.50 | 7.50 |
| 8210. <i>Cyprinus carpio</i> , carp..... | 8.50 | 16.75 | ..... |
| 8211. <i>Rana esculenta</i> , frog..... | 5.75 | 8.50 | 4.25 |

METAMORPHOSES.

In alcohol.
Prices net,
duty free.

Development of Chicken, *Gallus domesticus*, in clear Bohemian glass jars.

| | | |
|--------|---|----------------|
| 8213A. | Five stages, from second day until one day before hatching..... | \$ 12.00 |
| 8213B. | Twelve stages | 20.00 |
| 8213C. | Twenty-one stages, complete series, illustrating every stage of incubating..... | 38.00 |
| 8214. | <i>Lacerta agilis</i> , sand lizard..... | 4.50 |
| 8215. | <i>Tropidonotus natrix</i> , grass-snake..... | \$4.00 to 6.75 |
| 8216. | <i>Rana esculenta</i> , common water frog.... | 5.00 |
| 8217. | <i>Cyprinus carpio</i> , carp..... | \$5.00 to 6.75 |
| 8218. | <i>Salmo salar</i> , common salmon... \$4.00 to | 7.75 |
| 8219. | <i>Helix pomatia</i> , garden snail... \$4.00 to | 5.75 |

Dry mounts.
Prices net, duty free.

COLEOPTERA.

| Beetles. | A. | B. |
|--------------------------------------|-----------------------------|-------------------------|
| | In Pasteboard Box, 15x20cm. | In Wooden Box, 20x30cm. |
| 8221. <i>Lucanus cervus</i> | \$ 2.50 | \$ 3.75 |
| 8222. <i>Anthonomus pomorum</i> . | 1.75 | .... |
| 8223. <i>Prionus coriarius</i> | 2.50 | .... |

HYMENOPTERA.

Bees, wasps, ants, etc.

| | | |
|--------------------------------------|------|------|
| 8225. <i>Apis mellifica</i> | 1.75 | 2.75 |
| 8226. <i>Bombus terrestris</i> | 1.75 | 3.00 |
| 8227. <i>Vespa crabro</i> | 1.75 | 3.00 |
| (See illustration next page.) | | |
| 8228. <i>Vespa vulgaris</i> | 1.75 | 3.00 |

LEPIDOPTERA.

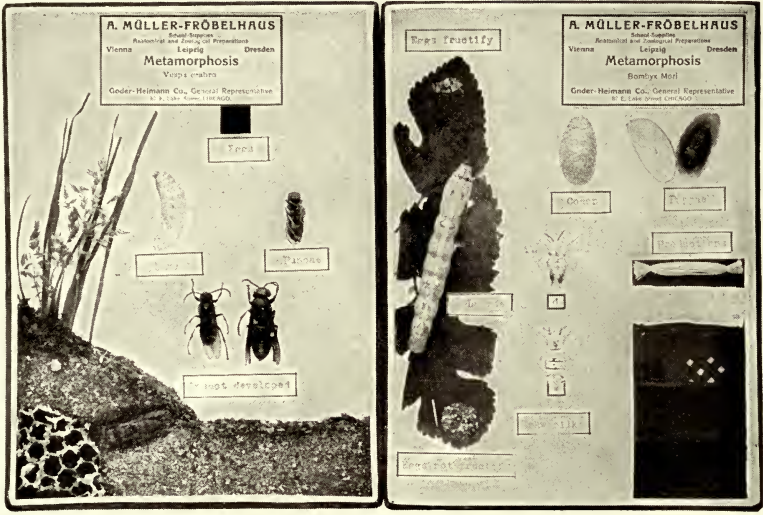
Butterflies and Moths.

| | | | |
|-------|--|------|------|
| 8230. | <i>Parnassius apollo</i> | 2.50 | 3.75 |
| 8231. | <i>Pieris brassicae</i> | 1.75 | 3.00 |
| 8232. | <i>Vanessa antiopa</i> | 1.75 | 3.00 |
| 8233. | <i>Sphinx ligustri</i> | 1.75 | 3.00 |
| 8234. | <i>Phalera bucephala</i> | 1.75 | 3.00 |
| 8235. | <i>Euproctis chrysorrhoea</i> | 1.75 | 3.00 |
| 8236. | <i>Dendrolimus pini</i> | 1.75 | 3.00 |
| 8237. | <i>Catocala fraxini</i> | 2.50 | 3.00 |
| 8238. | <i>Catocala nupta</i> | 1.75 | 3.00 |
| 8239. | <i>Catocala sponsa</i> | 1.75 | 3.00 |
| 8240. | <i>Carpocapsa pomonella</i> | 1.75 | .... |
| 8241. | <i>Cossus cossus</i> | 1.75 | 3.00 |
| 8242. | <i>Bombyx mori</i> (see illustration next page)..... | 1.75 | 3.00 |
| 8243. | <i>Platysamia cecropia</i> ..... | .... | 8.50 |



No. 8216.

METAMORPHOSES—Continued.



No. 8227.

No. 8242.

Dry mounts,
Prices net, duty free.

| A. | B. |
|--------------------------------|----------------------------|
| In Pasteboard Box, 15x20cm. | In Wooden Box, 20x30cm. |

DIPTERA AND NEUROPTERA.

Flies, etc.

| | | | |
|-------|--------------------------------|--------|--------|
| 8245. | <i>Musca domestica</i> | \$1.75 | \$.... |
| 8246. | <i>Gastrophilus equi</i> ..... | ..... | 3.75 |
| 8247. | <i>Chrysopa vulgaris</i> | 1.75 | ..... |

ORTHOPTERA.

Grasshoppers, Locusts, etc.

| | | | |
|-------|---------------------------------------|------|-------|
| 8250. | <i>Libellula quadrimaculata</i> | 1.75 | ..... |
| 8251. | <i>Mantis religiosa</i> | 1.75 | 3.00 |
| 8252. | <i>Gryllus campestris</i> | 1.75 | 3.00 |
| 8253. | <i>Locusta viridissima</i> | 1.75 | ..... |

HEMIPTERA.

Bugs.

| | | | |
|-------|----------------------------------|------|-------|
| 8255. | <i>Pyrrhocoris apterus</i> | 1.75 | ..... |
| 8256. | <i>Notonecta glauca</i> | 1.75 | ..... |
| 8257. | <i>Nepa cinerea</i> | 1.75 | ..... |
| 8258. | <i>Cicada orni</i> | 1.75 | ..... |

METAMORPHOSES—Continued.

LIFE HISTORIES OF NORTH AMERICAN INSECTS.

Mounted dry in "Riker's Specimen Mounts." [See page 40 for prices of Mounts only.]



ILLUSTRATING METHOD OF MOUNTING.

Noxious Insects.

LEPIDOPTERA.

Butterflies and Moths.

| | Prices Net. |
|---|-------------|
| 9771A. <i>Pieris rapae</i> , cabbage butterfly..... | \$ 2 75 |
| 9771B. <i>Eu Vanessa antiopa</i> , mourning cloak..... | 3 00 |
| 9771C. <i>Carpocapsa pomonella</i> , codling moth..... | 3 50 |
| 9771D. <i>Laphygma frugiperda</i> , fall army worm..... | 2 50 |
| 9771E. <i>Leucania unipunctata</i> , army worm..... | 2 50 |
| 9771F. <i>Ocneria dispar</i> , gypsy moth..... | 3 50 |
| 9771G. <i>Protoparce carolina</i> , tomato sphinx..... | 4 00 |
| 9771H. <i>Protoparce celeus</i> , potato or tobacco sphinx..... | 4 00 |
| 9771I. <i>Sannina exitiosa</i> , peach borer..... | 2 75 |
| 9771J. <i>Heliothis armigera</i> , boll-worm, corn worm or tomato worm..... | 3 00 |
| 9771K. <i>Euproctis chrysorrhoea</i> , brown tail moth..... | 3 00 |

ORTHOPTERA.

Grasshoppers, Locusts, etc.

| | |
|---|-------|
| 9773A. <i>Termes fatalis</i> , white ant..... | 10 50 |
| 9773B. <i>Gryllus campestris</i> , field cricket..... | 2 75 |
| 9773C. <i>Gryllus domesticus</i> , house cricket..... | 2 75 |
| 9773D. <i>Gryllotalpa vulgaras</i> , mole cricket..... | 2 75 |
| 9773E. <i>Melanoplus spretus</i> , Rocky Mountain locust..... | 2 75 |

LIFE HISTORIES—Continued.**COLEOPTERA.****Beetles.**

Prices Net.

| | | |
|--------|---|---------|
| 9772A. | <i>Doryphora decemlineata</i> , potato bug..... | \$ 2 50 |
| 9772B. | <i>Anasa tristis</i> , squash bug..... | 2 75 |
| 9772C. | <i>Macroductylus subspinosus</i> , rose bug..... | 3 00 |
| 9772D. | <i>Passalus cornutus</i> , horn bug..... | 3 75 |
| 9772E. | <i>Anthonomus grandis</i> , cotton boll weevil (Mexican)..... | 2 00 |
| 9772F. | <i>Saperda candida</i> , apple-borer..... | 2 75 |
| 9772G. | <i>Conotrachelus nenuphar</i> , plum-curculio..... | 3 50 |
| 9772H. | <i>Diabrotica vittata</i> , striped cucumber beetle..... | 2 75 |
| 9772J. | <i>Dermestes lardarius</i> , larder beetle..... | 2 75 |

HEMIPTERA.**Bugs.****DIPTERA.****Flies.**

Many others on application.

Beneficial Insects.**LEPIDOPTERA.**

| | | |
|-------|------------------------------------|------|
| 9776. | <i>Bombyx mori</i> , silkworm..... | 4 75 |
|-------|------------------------------------|------|

COLEOPTERA.

| | | |
|--------|--|------|
| 9777A. | <i>Necrophorus americana</i> , carrion beetle..... | 3 50 |
| 9778B. | <i>Coccinella novempunctata</i> , ladybug..... | 3 50 |

HYMENOPTERA.

| | | |
|-------|--|------|
| 9779. | <i>Apis mellifica</i> , honey bee..... | 7 00 |
|-------|--|------|

MIMICRY.**Real Mimicry.**

Butterflies that closely resemble in form and color species which birds and insects will not attack on account of the poisonous taste.

| | | |
|-------|--|------|
| 9780. | <i>Limenitis dissipus</i> , same color and markings as <i>Danais archippus</i> , which is not molested | 2 75 |
|-------|--|------|

Protective Coloration.**MIMICRY OF COLOR ONLY.**

| | | |
|--------|---|------|
| 9780A. | <i>Catocala relictata</i> ("white ribbon"), showing male and female, also one specimen at rest on birch bark..... | 4 00 |
| 9780B. | <i>Catocala amatatrix</i> ("red ribbon"), showing male and female, also one specimen at rest on bark..... | 2 50 |

MIMICRY OF COLOR AND FORM.

| | | |
|--------|---|-------|
| 9780C. | <i>Kallima inachus</i> (leaf butterfly), mimicking a leaf to perfection in both color and form (from East India)..... | 4 00 |
| 9780D. | <i>Anisomopha buprestoides</i> (walking-stick), from Florida..... | 1 75 |
| 9780E. | <i>Phasma gigantes</i> (giant walking-stick), with wings, male and female (from East India) | 10 00 |
| 9780F. | <i>Valgus candiculatus</i> and others. Three insects that imitate buds of twigs | 2 50 |

Warning Colors and Form.

| | | |
|--------|---|------|
| 9780G. | <i>Caligo oilus</i> (owl butterfly), mimicking an owl's head..... | 4 50 |
| 9780H. | <i>Attacus atlas</i> (cobra-head moth), mimicking a snake's head..... | 4 50 |
| 9780K. | <i>Papilio blumei</i> , green banded East Indian butterfly..... | 3 00 |
| 9780L. | <i>Morpho cypris</i> , blue butterfly from Brazil, the most gorgeous butterfly in the world | 3 00 |

(Note—The last two butterflies scare birds away by their loud colors.)

LIVE MATERIAL.

We do not handle live material but would refer our customers to the following firms:

The Anglers Bait and Manufacturing Co., 333 W. South Water St., Chicago, for live frogs, minnows, crayfish, etc.

A. A. Sphung, North Judson, Ind., for all fresh water material.

C. S. Brimley, Raleigh, N. C., for all salt water material.

NEW ANATOMICAL WALL MAPS.



No. 8301.

Painted by Franz Frohse under supervision of Prof. Dr. Broesicke and Prof. Dr. Benninghoven of the University of Berlin—the co-operation of one of Germany's most able artists with two professionals of reputation. These charts combine scientific exactness and artistic workmanship with the highest degree of educational value, and are the best that are on the market in every respect. Mounted on linen and common rollers, per chart, Net \$ 4.00

8301. Male skeleton with ligaments, front view.

8302. Male skeleton with ligaments, rear view.

8303. Muscular system, front view.

8304. Muscular system, rear view.

8305. Heart and blood vessels.

8306. Pectoral and abdominal intestines in situ, I.

8307. Pectoral and abdominal intestines in situ, II.

8308. Pectoral and abdominal intestines in situ, III.

8309. Single viscera, illustrated.

8310. Brain, spinal process and nerves.

8311. Diagram of circulatory system.

8312. Ear.

8313. Eye.

8314. Skin.

No. 8345. MYERS' MECHANICAL MODEL OF THE EYE.

Patented Oct. 29, 1912.

This model of the eye, the invention of Jesse J. Myers, Assistant Professor of Physiology, Michigan Agricultural College, demonstrates the mechanics of normal accommodation, and also shows the cause and effect of far and near sight. All this is accomplished in so simple a manner that the model can be used successfully in the grades of the public schools as well as in colleges. It is also useful to oculists and opticians when they wish to explain to their patients their condition and the correction proposed.

The model illustrated in Fig. 1 is enclosed in a finely finished case, 19½x15½x3 inches, provided with a glass front. Beneath this glass is a heavy bottom, which serves as a base to which are attached the parts of the model. As shown in Fig. 2, the eye is represented in longitudinal section by four pieces, a, b, b¹, c.

The piece a which represents the anterior part of the sclerotic coat, is fastened to the base, the other three parts are movable. The pieces, b, b¹, which represent the anterior portion of the choroid coat, are so arranged mechanically that they are capable of motion in a curved line, so that they can be brought forward and together, also backward and apart. An elastic hoop, representing the crystalline lens, is suspended between these two pieces. When these pieces approach each other, the tension of the hoop is lessened and it assumes a more rounded form. Two coil springs, d and d¹, representing the ciliary muscles contracting, aid in this movement to round out the lens. The effects of relaxing these muscles is shown by moving the pieces b and b¹ apart, thus increasing the tension and making the hoop less rounded. Thus simple accommodation is demonstrated.

The piece c represents the posterior part of the eye ball. Its three layers are represented each by a different color. This piece is capable of a backward and forward motion, thus elongating the eye ball to represent the condition of near sight and shortening it to represent the condition of far sight.

Two wires attached to the front side of the elastic hoop pass back across the hoop, converging and crossing each other near the back of the eye ball.

These represent two rays of light, and where they intersect the focal point. As the hoop becomes more rounded the intersection approaches the hoop. The reverse is true when the hoop becomes less rounded.

Thus there is represented in a visual way both normal and abnormal optics of the eye.

All movements of the model are controlled at the back by two knobs. One knob controls the shape of the elastic hoop, and by means of the other knob the piece c can be moved backward and forward, thus changing the length of the eye ballNet \$ 7.50

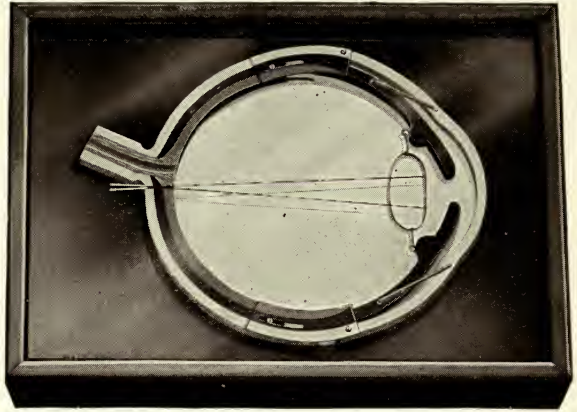


Fig. 1.

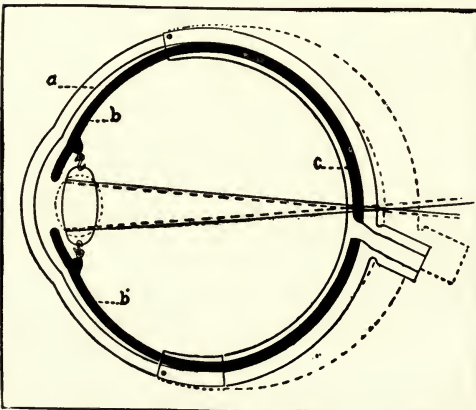


Fig. 2.



No. 8347.

8347. Natural Eye Model. A real, natural eye scientifically prepared and mounted. These eyes are first hardened and fixed, then sectioned in half and mounted in a glass cup in such a manner as to show clearly a half-section, horizontal view of the interior of the eye. Every part of the anatomy of the eye is held in its natural position by the careful method of preparation.

By its use the student can actually see not only the different coats of the eye ball, but the inner structures as well. From it one can pick out such minute structures as the blood vessels of the retina, capsule of the lens, suspensory ligament of the lens, etc. The normal relationship of the parts is preserved, enabling one to actually visualize the working parts of the eye, and in this way not only get, but retain a knowledge of this subject which it would be impossible to obtain from a cut alone.

These eyes are all mounted by an expert pathologist, and the time and skill required are very great, but the result is a real work of art. They are absolutely permanent, and we guarantee them to remain unchanged as long as the glass cell is not broken, or removed from the box. We also guarantee each one to be perfect and free from imperfections of any kind, and will cheerfully exchange any which fail to give entire satisfaction.

A diagram, carefully keyed to match the model, accompanies each one, making it easy to identify each part.....Net \$ 10.00

ANATOMICAL MODELS.

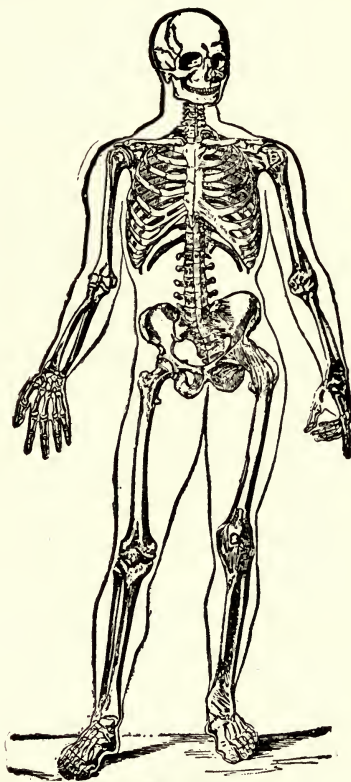
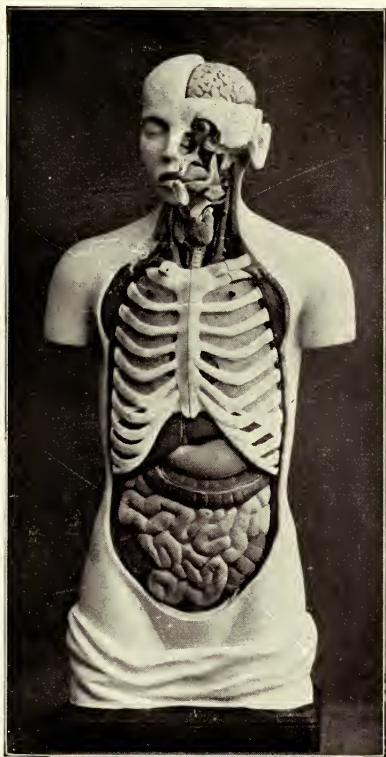
The models listed below are made of papier-mache and are unbreakable. The anatomical accuracy of the models, as well as their durability, makes them more serviceable than any models now on the market.



No. 8350.

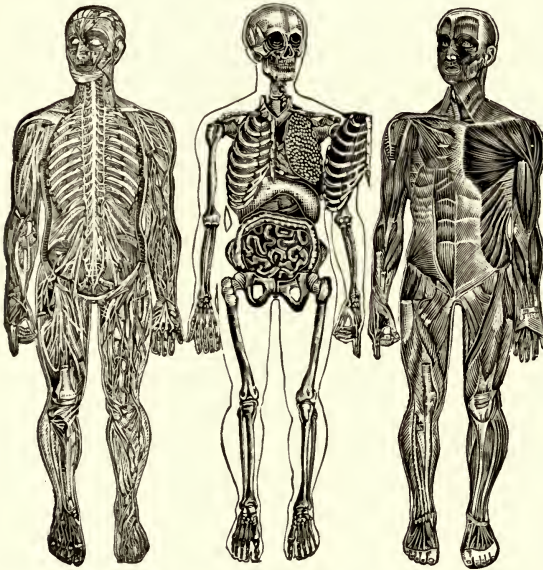
Prices Net.

| | | |
|-------|--|----------|
| 8350. | Head, upon stand, median sagittal section. One half shows the muscles and the median surface, the other half the bony skull; the arteries, veins and nerves of the teeth are exposed, the half of the brain may be disarticulated into 6 parts; the muscles of neck are also shown. This is an excellent model.....Duty free | \$ 20.00 |
| 8351. | Head, same as No. 8350, from stock.....Duty paid | 27.50 |
| 8352. | Half Head in median sagittal section, on board, skull bones as well as the cranial cavities, cerebrum, cerebellum, spinal cord, nasal septum, larynx, tongue, palate and oesophagus are well shown.....Duty free | 4.25 |
| 8353. | Half Head, same as No. 8352, from stock.....Duty paid | 5.50 |
| 8354. | Brain, natural size, with nerves attached. The brain may be disarticulated into four parts.....Duty free | 4.25 |
| 8355. | Brain, same as No. 8354, from stock.....Duty paid | 5.50 |
| 8356. | Brain, with nerves attached, natural size, may be disarticulated into 12 parts .....Duty free | 8.00 |
| 8357. | Brain, same as No. 8356, from stock.....Duty paid | 11.00 |
| 8358. | Eyeball (enlarged 3 diameters), may be disarticulated into sclerotic and choroid coats, aqueous humor and lens.....Duty free | 3.25 |
| 8359. | Eyeball, same as No. 8358, from stock.....Duty paid | 4.25 |
| 8360. | Eye (enlarged 3 diameters), shown in anatomical position; the bones of the orbit with all muscles; the superior rectus may be removed, the model may be disarticulated into sclerotic and choroid coats, aqueous humor and lens.....Duty free | 13.50 |
| 8361. | Eye, same as No. 8360, from stock.....Duty paid | 17.00 |
| 8362. | Ear (enlarged 3 times), with concha; may be disarticulated into labyrinth, incus, malleus, stapes and tympanum.....Duty free | 5.50 |
| 8363. | Ear, same as No. 8362, from stock.....Duty paid | 7.75 |
| 8364. | Skin (enlarged 150 times), in vertical section, the 3 skin strata, the sebaceous and sweat glands, the hair follicles, arteries, veins and nerves are shown.....Duty free | 3.25 |
| 8365. | Skin, same as No. 8364, from stock.....Duty paid | 4.25 |
| 8366. | Larynx, natural size, with cartilages and ligaments, separable into two halves .....Duty free | 2.75 |
| 8367. | Larynx, same as No. 8366, from stock.....Duty paid | 3.75 |



- | | | | |
|-------|--|-----------|------------------|
| | No. 8373. | | No. 6801. |
| 8368. | Heart, natural size, made to open..... | Duty free | \$ 2.75 |
| 8369. | Heart, same as No. 8368, from stock..... | Duty paid | 3.75 |
| 8370. | Lungs, with heart and larynx, natural size, all three models may be taken apart. On board..... | Duty free | 6.75 |
| 8371. | Lungs, same as No. 8370, from stock..... | Duty paid | 8.25 |
| 8372. | Trunk, natural size, standing, all internal organs are removable..... | Duty free | 25.50 |
| 8373. | Trunk (Model 1911). This trunk of boy is an exceptionally satisfactory one and is the only one made that shows the relation of the ribs to the internal organs. The organs of the head and neck especially are very clearly shown. The trunk is entirely dissectable. This trunk is particularly recommended where lack of space or price prohibit the purchase of detail models.. | | |
| | | Duty free | 55.00 |
| 8374. | Male figure, 60cm. high, standing on base. Head and brain made to take apart, and the internal organs may be taken out for demonstration. The superficial muscles of one arm and one leg are detachable. Very fine model..... | | |
| | | Duty free | 55.00 |
| 8375. | Male figure, life size. Exact representation of all muscles, arteries, veins and nerves. As it may be separated into about 60 parts, this model renders easy the demonstration of all important anatomical parts of the human body. It shows in a single preparation details which otherwise can only be shown in special models. It shows also the general relations of the various parts. The model is prepared from numerous anatomical dissections in Leipzig under the valuable instruction of Mr. C. Hagedorn, dissector at the Leipzig Institute, so that anatomical accuracy is combined with perfect workmanship. Testimonials of purchasers can be forwarded if desired. The structure of this model renders unnecessary the purchase of separate models. This model is recommended in all cases where funds permit and where a complete representation of the anatomy of the human subject is desirable.. | | |
| | | Duty free | 325.00 |
| 6801. | Human Skeleton. Best grade, carefully selected, finely developed, perfectly cleansed and prepared, substantially articulated, with ring for suspension at top..... | | |
| | | | 43.00 |
| 6805. | Case for Skeleton. Finely finished hardwood, glass door and sides, lock and key | | |
| | | | 22.00 |

ANATOMICAL MANIKINS.



No. 6830.

life study—man—in the form of a manikin. It is important that you get the best manikin.

THE PILZ MANIKIN.

5 feet 5 inches high.

A life size figure of the human body, lithographed in natural colors on indestructible heavy linen cardboard. There are thirty large folds—455 parts shown. No part is detached, so that there is no trouble putting on and taking off, and there are no small parts to lose. It shows the blood vessels, nerves, muscles, internal organs and the skeleton in their proper position and relative dimensions, as follows:

Part I. The muscles of the anterior surface of the body. On the right side the superficial muscles are partially removed in order to bring the deeper layers into view. This section shows and designates 85 different muscles.

Part II. The muscles of the posterior surface of the body. On this plate also some of the superficial muscles are partially removed, so that the deeper layers may be recognized. At the occiput a portion of the cranium is removed, showing the brain in the cavity of the skull. There are 71 muscles shown in this section.

Part III. The circulation of the blood. The course of the arterial blood is marked in red, that of the venous blood in blue. This plate shows 61 different veins.

Part IV. The nervous system. The posterior portion of the cranium is shown removed longitudinally so as to bring into view the skull contents. This plate shows 76 nerves.

Part V. The skeleton. In this plate 101 parts of the skeleton and 60 parts of the viscera are shown in actual size and colors.

| | |
|--|----------|
| 6830. Pilz Life Size Sexless Manikin | \$ 13.50 |
| 6831. Pilz Life Size Male Manikin | 13.50 |

THE MINDER MANIKIN.

20 inches high.

A great many people realize their need of a manikin, yet do not feel like paying the price of a life size figure. Among these are students at colleges and schools, young people interested in physiology or in physical development, and many men who appreciate the value of having in their homes the most valuable text book made.

For these people the Minder manikin is published. This is the same as the large one, except in size, and in the quality of paper. There are the same number of parts with the exception of the posterior muscles, which are not shown on the smaller manikin. A key, with all the parts named and numbered, is furnished. The folding plan is the same, the colors the same.

| | |
|---|------|
| 6832. Minder Miniature Sexless Manikin..... | 2.75 |
| 6833. Minder Miniature Female Manikin..... | 3.50 |

MICROSCOPIC SLIDES FOR BOTANY.

This Set of Mounted Microscopic Specimens has been prepared to meet the requirements of a one year or six months course in Botany. To cover the work in this time and still embrace the whole Plant Kingdom, it is necessary to present only the most important and representative specimens of each type. In this collection the series is unbroken from the lowest algae to the flowering plant.

We are sure our trade will find in this set abundant material for the modern laboratory course.

These slides are prepared by eminent Botanists, beautifully stained and permanently cemented.

We prefer not to break the set.

The following is the list of slides:

| | | | |
|--------------|---|----|--|
| Algae | { | 1 | Spirogyra, conjugating and vegetating. |
| | | 2 | Vaucheria, fruiting. |
| | | 3 | Diatoms. |
| Fungi | { | 4 | Mucor, conjugating. |
| | | 5 | Coprinus (mushroom), fruiting. |
| | | 6 | Wheat rust, Aecidium stage. |
| Mosses | { | 7 | Antheridia of Mnium. |
| | | 8 | Archegonia of Mnium. |
| | | 9 | Sporophyte of Mnium. |
| Liverworts | { | 10 | Archegonia of Marchantia polymorpha. |
| | | 11 | Antheridia of Marchantia polymorpha. |
| | | 12 | Prothallium of Pteris aquilina. |
| Ferns | { | 13 | Archegonia and Antheridia of Pteris aquilina. |
| | | 14 | Sporangia of Pteris aquilina. |
| | | 15 | Stem of Pteris aquilina. |
| Pine | { | 16 | Cross and longitudinal section of stem. |
| Lilium | { | 17 | Stamen, with mature pollen. |
| | | 18 | Ovaries, with ovules and embryo sac. |
| Smilax | | 19 | Root, cross-section. |
| Corn | | 20 | Stem, cross-section. |
| Rue | | 21 | Leaf, cross-section. |
| Capsella | | 22 | Embryos. |
| Basswood | | 23 | Cross and longitudinal section of Woody Stem. |
| Brasenia | | 24 | Cross-section of typical Water Plant. |
| Tradescantia | | 25 | Longitudinal section of Root, showing typical root tip and also many karyokinetic figures. |

| | | |
|--|-----|--------|
| 8401. Complete Set of 25 Slides in Case..... | Net | \$7.50 |
| 8402. Single Slides | Net | .35 |

MICROSCOPIC SLIDES FOR PHYSIOLOGY.

Set of 25 Mounted Microscopic Slides adapted for any text book. The most important and representative specimens are presented in a neat and permanent manner.

| | |
|---------------------------------------|-------------------------------------|
| 1. Bone, longitudinal section. | 14. Skin, showing hair follicles. |
| 2. Bone, cross-section. | 15. Nerve Cells. |
| 3. Cartilage, hyaline, showing cells. | 16. Spinal Cord, cross-section. |
| 4. Cartilage, elastic. | 17. Cerebrum. |
| 5. Testis. | 18. Cerebellum. |
| 6. Muscle, striated, showing nuclei. | 19. Ovary. |
| 7. Intestine, small, injected. | 20. Tongue. |
| 8. Villi, stained. | 21. Oviduct. |
| 9. Intestine, large, stained. | 22. Artery and Vein, cross-section. |
| 10. Kidney, injected and stained. | 23. Cells of Squamous Epithelium. |
| 11. Liver, showing cells. | 24. Cardiac Stomach. |
| 12. Pancreas. | 25. Adipose Tissue. |
| 13. Lung. | |

| | | |
|--|-----|--------|
| 8403. Complete Set of 25 Slides in Case..... | Net | \$7.50 |
| 8404. Single Slides | Net | .35 |

MICROSCOPIC SLIDES FOR ZOOLOGY.

Set of 25 Mounted Microscopic Slides adapted for any text book. The most important and representative specimens are presented in a neat and permanent manner.

| | |
|---|--|
| 1. Paramoecium, showing general body structure, nuclei, vacuoles, etc. | 11. Antenna of Fly. |
| 2. Cross-section Sponge, Grantia. | 12. Wing of Fly. |
| 3. Longitudinal section of Sponge, Grantia. | 13. Wing of Butterfly. |
| 4. Hydroid Colony, Campanularia. | 14. Wing Hooks of Wasp. |
| 5. Cross-section of Hydra, showing body layers. | 15. Wing Feather. |
| 6. Cross-section of Earthworm, showing body structure. | 16. "Down" Feather. |
| 7. Asterias, eggs and early cleavage stages. | 17. Proboscis of Fly. |
| 8. Cross-section of Gill of Clam, showing blood vessels, water passages, etc. | 18. Proboscis of Female Mosquito. |
| 9. Antenna of Male Moth. | 19. Proboscis of Butterfly. |
| 10. Antenna of Female Moth. | 20. Mouth Parts of Bee. |
| | 21. Radula of Snail. |
| | 22. Trachea of Insect. |
| | 23. Cross-section of Crop of Grasshopper, showing chitinous teeth. |
| | 24. Sting of Wasp. |
| | 25. Section of Compound Eye of an Insect. |

| | | |
|--|-----|--------|
| 8405. Complete Set of 25 Slides in Case..... | Net | \$7.50 |
| 8406. Single Slides | Net | .35 |

Botanical Lantern Slides from Photomicrographs of actual preparations listed on next page.

Bacteriological Slides. See page 91.

LANTERN SLIDES.

We are prepared to furnish lantern slides upon any subject on short notice. There is such an immense variety of slides now on the market that a complete list of them forms a separate catalog. If the customer will intrust the selection to us we will use our best judgment in filling an order, or we can send a complete list of the slides best adapted for school work, as follows:

Anatomy and Physiology, 150 slides.

Astronomy, 75 slides.

Botany, 200 slides.

Crystallography, 50 slides.

Geology, 250 slides.

Physiography, 350 slides.

Spectrum Analysis, 20 slides.

Zoology, 50 slides.

If Interested

SEND FOR

Catalog Q

LANTERN SLIDES

Price, Plain Slides, each..... \$ 0.40

Price, Colored Slides, each..... .80

BOTANICAL LANTERN SLIDES.

From Photomicrographs of Actual Preparations.

(Copyright, 1903, by Wm. H. Knapp.)

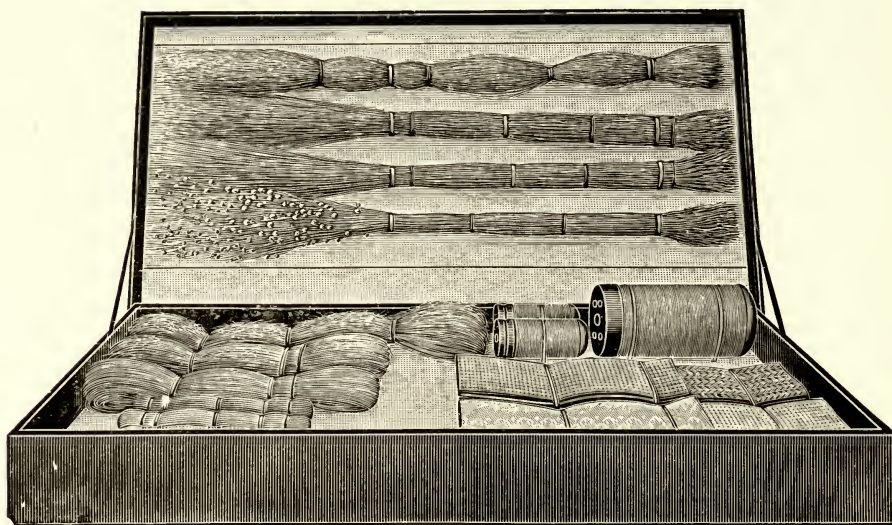
The following twenty-five lantern slides were made from actual mounted preparations selected with the utmost care to show all the structures in the various groups of plants as they are now presented in the best high school courses in botany. Their superiority over slides made from book illustrations, drawings, etc., is at once apparent. The various plant structures appear upon the screen as they actually are in the mounted preparation, and from them the student can get much help in interpreting his own work. They are of invaluable aid to the live teacher, who, by their use, can convey the right idea of plant structures to an entire class instead of to each student separately. Credit is due to Dr. Chas. J. Chamberlain and Mr. W. J. G. Land of the University of Chicago; to Dr. Chamberlain for suggestions, the description and the use of splendid preparations; to Mr. Land for many fine micro slides.

1. **Spirogyra.** A very complete series, showing all stages in zygosporic reproduction, from the scarcely altered vegetable cells up to the mature zygosporic. Many of the more usual peculiarities in the formation of zygosporic are also shown.
2. **Diatoms.** A beautiful slide of Mobile Bay diatoms, showing *Navicula*, *Triceratium*, *Coccinodiscus*, and other forms.
3. **Mucor stolonifer.** Mycelium and several stages of zygosporic reproduction.
4. **Puccinia graminis.** The Rust of Wheat and Oats; a section of Barberry leaf, showing the aecidium (cluster cup) stage.
5. **Coprinus comatus.** Shaggy Mane Mushroom; a transverse section of the gills, showing trama, basidia with sterigmata and spores, and also the paraphyses.

6. **Bryum proliferum.** Moss; longitudinal section, showing archegonia and paraphyses. The egg (oosphere) and ventral canal cell are clearly shown.
7. **Polytrichum commune.** Moss; longitudinal section, showing numerous antheridia.
8. **Bryum proliferum.** Moss; three longitudinal sections of the entire capsule and part of the seta, showing columella, spore tissue, air chambers, annulus, peristome, and operculum.
9. **Marchantia polymorpha.** Longitudinal section of antheridiophore, showing antheridia in various stages.
10. **Marchantia polymorpha.** Longitudinal section of archegoniophore, showing archegonia.
11. **Pteris aquilina.** The Bracken Fern; traverse section of the rhizome. The various tissues and even the cells are sharply differentiated.
12. **Pteris cretica.** The entire male prothallium, showing antheridia and rhizoids.
13. **Pteris cretica.** Longitudinal section of the female prothallium, showing archegonium with the egg (oosphere) ventral canal cell and neck canal cells. The vegetative cells show nuclei and chlorophyll granules.
14. **Pteris cretica.** Transverse section of a leaf, showing sporangia in various stages of development. The annulus and spores are particularly clear. The "false indusium" and the structure of the leaf are also shown.
15. **Pinus laricio.** Austrian Pine; longitudinal section of ovule, containing female gametophyte with archegonia. A pollen tube is shown in the nucellus and the seed coats are beginning to appear.
16. **Pinus banksiana.** Longitudinal and transverse sections of a 4-year-old stem, showing pith, cortex, xylem, phloem, annual rings, medullary rays, resin ducts, etc.
17. **Lilium tigrinum.** Transverse section of nearly ripe anther. Two pollen sacs, each formed by the breaking down of the wall between a pair of microsporangia, are very clear. The stomium, endothecial layer, and pollen grains are extremely sharp, even the tube nuclei and generative nuclei of the individual pollen grains appearing on the screen.
18. **Lilium canadense.** Transverse section of the ovary. The ovules show funiculus, integuments, nucellus, and embryo sac.
19. **Smilax herbacea.** Transverse section of the root, showing xylem, phloem, endodermis, etc.
20. **Zea mays.** Indian Corn; transverse section of stem, showing typical monocotyl stem structure.
21. **Ruta graveolens.** Rue; transverse section of a leaf, showing epidermis, palisade, spongy parenchyma, crystals, oil glands, etc.
22. **Capsella bursa-pastoris.** Shepherd's Purse; longitudinal section of entire seed, showing the dicotyledonous embryo with complete suspensor, endosperm, micropyle, beginning of seed coats, etc. This slide, if explained by a competent teacher, is worth the price of the whole collection.
23. **Xanthium canadense.** Cockle Burr, transverse section of stem, showing typical structure of a dicotyledonous herb.
24. **Tilia americana.** Basswood; transverse and longitudinal sections of a 2-year-old stem, showing typical structure of a woody dicotyledon.
25. **Brasenia peltata.** Transverse section of stem, showing large air spaces, and the characteristic reduction of vascular tissue found in water plants.

| | | |
|-------|--|----------|
| 8410. | Complete Set, as above described, in strong carrying case..... | \$ 13.35 |
| 8411. | Single Slide, each..... | 1.10 |

TECHNOLOGICAL COLLECTIONS.



No. 10228.
Collection 13,

10228. **Technological Collections** of various industries were prepared by Dr. Max Pietsch, Director of the Public Commercial School and Instructor in the Commercial High School of Leipzig, Germany, to meet the demand for the use of good illustrative mediums in the study of manufactured products. These collections are furnished in substantial containers of light varnished wood or black cloth covered cartons with strong wooden frames. The samples are displayed in glasses with metal screw caps or mounted in strong cartons, all accurately labeled, and are of sufficient size to show character and construction of each and to impress its form upon the student.

CONTENTS OF THE SCHOOL COLLECTIONS.

No. 1. Grape and Cane Sugar.

1. Saccharine. 2. Green potato starch. 3. Cube sugar. 4. Loaf sugar. 5. Pulverized sugar. 6. Starch syrup. 7. Refined syrup. 8. Caramel. 9. Sugar cane. 10. Colonial sugar. 11. Colonial sugar syrup.....Duty free \$ 5.00

No. 2. Beet Sugar.

1. Beet shreds. 2. Raw juice. 3. Thin juice. 4. Thick juice. 5. Beet core. 6. Corn sugar. 7. By-product. 8. Molasses. 9. Bone carbon. 10. Beet sugar. 11. Ground beet sugar. 12. Melis juice. 13. Loaf sugar. 14. Crystal sugar. 15. Lump sugar. 16. Rock candy.....Duty free 5.00

No. 3. Coffee.

1. Coffee tree twig, with fruit. 2. Loose fruits. 3. Beans with hull. 4. Pearl coffee. 5. Broken coffee. 6. Roasted coffee. 7. Coffee extract. 8. Mocha. 9. Java. 10. Brazil coffee. 11. Chicory. 12. Malt coffee.....Duty free 5.00

No. 3-A. Tea.

13. Tea leaves. 14. Pecco. 15. Souchong. 16. Congo. 17. Gunpowder. Duty free. 2.50

No. 4. Cocoa.

1-4. Commercial varieties. 5. Roasted cocoa. 6. Cocoa shells. 7. Crushed cocoa beans. 8. Ground cocoa. 9. Ground dried cocoa. 10. Dried cocoa. 11. Cocoa butterDuty free 4.00

No. 5. Tobacco.

1. Scrubs. 2. Raw leaf tobacco. 3. Rolled tobacco. 4. Havana tobacco. 5. Cuba. 6. Maryland. 7. Virginia. 8. St. Feix. 9. Varinas. 10. Java. 11. Sumatra. 12. Turkish. 13. Phalian. 14-15. Coarse and fine cut pipe tobacco. 16. Rolled tobacco. 17-20. Cigars in four shades. 21. Virginia cedar wood. 22-24. Several cigar forms. 25-26. Cigarettes with and without tip. 27. Cigarellos. 28. Carotte. 29. Snuff. 30-31. Chewing tobacco.....Duty free 6.75

TECHNOLOGICAL COLLECTIONS, Continued.**No. 6. Spices.**

- 1-2. Black and white pepper. 3. Spanish pepper. 4. Paprica. 5. Allspice. 6. Cloves. 7. Cinnamon. 8. Cinnamon bark. 9. Nutmegs. 10. Mace. 11. Long cardamon. 12-13. Ginger. 14. Vanilla. 15. Caper. 16. Saffron. 17-18. Black and white mustard. 19. Caraway seed. 20. Fennel. 21. Anise. 22. Star anise. Duty free \$ 5.00

No. 7. Sheep Wool and Treatment of Carded Wool.

- 1-4. Various kinds of raw wool, Merino, cross bred, German Farmer wool and German fine wool. 5. Wool cleaned on the sheep. 6-7. Scoured and snow white. 8. Factory washed wool. 9. Wool Potash. 10. Wool Fat. 11-13. White wool dyed black and blue in the fibre. 14. Wool dyed to blue gray in the separating machine. 15-16. Pelts, rough and fine curl. 17. Coarse yarn. 19. Carded wool. 19. Coarse woolen cloth (frieze). 20. Felt cloth. 21. Cloth woven of mixed yarn. 22. Cloth dyed in the piece. 23-24. Pieces of cloth, various finishes.....Duty free 6.75

No. 8. Treatment of Worsted.

1. Carded wool. 2. Woven cloth. 3. Waste wool. 4. Carded stuff. 5-6. Strips from the passages. 7. Raw carded yarn. 8. Unicolored. 9. Mixed. 10. Vigoureaux yarn. 11. Quilled comb yarn. 12-13. Muslin and cashmere. 14. Figured comb yarn. 15. Wool plush.....Duty free 5.00

No. 9. Shoddy and Various Animal Wool.

1. Long fibered rag wool. 2. Shoddy yarn. 3. Short fibered rag wool. 4. Mungo yarn. 5. Shoddy wool cloth. 6. Mohair wool. 7. Mohair yarn. 8. Mohair cloth. 9. Cashmere wool. 10. Alpaca wool. 11. Camel wool. 12. Camel hair cloth. Duty free 5.00

No. 10. Silks.

1. Mulberry worms. 2. Eggs. 3-5. Worms in various stages of development. 6. Mulberry leaves. 7-9. Cocoons. 10-11. Male and female cocoons. 12-13. Raw silks. 14. Thrown silk. 15. Silk wool. 16-17. Raw stuff of Chappe silk. 18-19. Chappe silk. 20. Taffeta. 21. Silk serge. 22. Atlas. 23. Silk damask. 24. Velour or Silk Plush. 25. Silk ribbons. 26. Artificial silk.....Duty free 6.75

No. 11 and 12. Cotton.

1. Capsule. 2. Seed. 3. Raw cotton with seed. 4. North America cotton. 5. E. Indian cotton. 6. Egyptian cotton. 7. Ginned cotton. 8. Cotton batting. 9. Carded cotton. 10. Woven goods. 11. Coarse thread. 12. Cops. 13. Watertwist. 14. Mull-twist. 15. Warcops. 16. Pincops. 17. Strands. 18. Cotton thread. 19-22. Gingham. 23. Fustian. 24. Cotton damask. 25. Manchester. 26. Fine canvas. 27. Mercerized cotton. 28. Cotton dyed in the fiber. 29. Vigigne yarn. 30. Vigigne yarn with and without sheep wool. 31. Weaving goods.....Duty free 6.75

No. 13. Flax or Linen.

1. Flax stems with capsule. 2. Flax straw. 3. Roasted and dried flax. 4. Broken flax. 5. Slung flax. 6. Combed flax. 7. Knitted goods. 8. Coarse spun. 9-10. Wet and dry spun. 11-12. Linen yarn, raw and bleached. 13. Linen thread. 14-15. Raw and bleached linen. 16. Ticking. 17. Linen damask.....Duty free 5.50

No. 14. Hemp and Tow, Oakum.

1. Hemp stems. 2. Raw hemp. 3. Spinning and clean hemp. 4. Hemp yarn. 5. Binding thread. 6. Tow. 7. Tow yarn. 8 to 10. Various rope goods...Duty free 3.50

No. 15. Jute and Other Plant Fibers.

1. Raw jute. 2. Jute string. 3. Rough spun. 4. Jute yarn. 5-6. Raw and dried jute fabric. 7. Raw Ramie. 8. Cleaned and bleached Ramie. 9. Manilla hemp. 10. Sisal hemp. 11. Cocoa fiber. 12. Wood cloth.....Duty free 4.75

- No. 16.** Iron and steel. 19 samples.....Duty free 12.50

- No. 17.** Manufacture of Iron and Steel Ware. Steps in the manufacturing of: 1. Table knife. 2. Table fork. 3. Pocket knife. 4. Shears. 5. Sewing needle. 6. Tin spoon. 7. Enameled tin plate. 8. Steel pen.....Duty free 10.50

- No. 18.** Copper. 11 samples.....Duty free 8.50

- No. 19.** Lead, tin, zinc and nickel, 23 samples.....Duty free 10.50

- No. 20.** Alloys, Brass, Tumbaks, Bronzes, German Silver, 11 samples. Duty free 7.50

- No. 21.** Manufactured of glass. (In preparation.).....Duty free. About 5.00

- No. 22.** Various steps in the making of a wine glass and a bottle. Six eachDuty free 4.00

- No. 23.** Manufacture of glass tubes, mirror glass, wired glass, ground, polished, etched, optical and colored glasses and steps in the making of a piece of Art Glass Ware. (In preparation.).....Duty free. About 5.00

- No. 24.** Tiles, Brick, Schamotte Ware. Common Delft Ware, Stone Ware, Fine Delft Ware, Terra Cotta Ware. (In preparation.).....Duty free. About 10.50

- No. 25.** Clinker (Dutch flat bottomed vessel), Wedgewood Dishes and Stone Ware. (In preparation.)Duty free. About 6.00

- No. 26.** Porcelain and its various kinds. Manufacture of porcelain..Duty free 7.50

GENERAL LABORATORY APPARATUS.

TAKEN FROM CATALOGUE M.

Alphabetically Arranged.

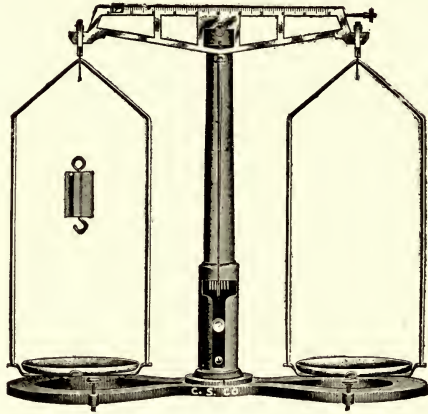
6013. **Asbestos Sheet**, full sheets 40 x 40 inches.
 Thickness, inches $\frac{1}{16}$ $\frac{1}{8}$ $\frac{3}{16}$ $\frac{1}{4}$
 Per sq. ft. \$0.10 .13 .17 .22
 Per sheet45 .90 1.25 1.65
6014. **Asbestos**, cut in squares, $4 \times 4 \times \frac{1}{16}$, per dozen \$ 0.22

3816. **Laboratory Balance.** Designed for schools desiring a more sensitive and convenient form of balance than the Harvard Trip Scale, at a slightly additional cost.

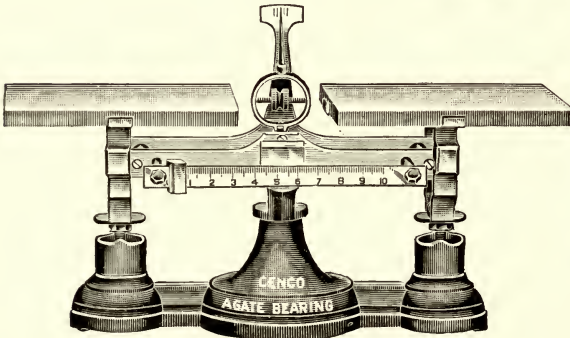
Capacity, 2 kilos.

Sensibility. Loads up to 2 kilos can be accurately weighed within 0.05 gram; light loads within 25 mg.

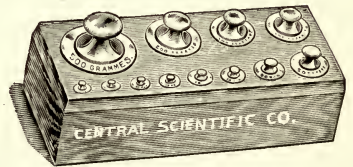
A rider upon beam indicates all amounts up to 10 grams by 1-10 gram divisions. With counterpoise 12.75



No. 3816.



No. 3830.



No. 3921.

3830. **"Cenco" Agate Bearing Trip Scale**, Harvard design. The Harvard Trip Scale has, for years, been used for rough weighing and the inaccuracies due to crude construction (imperfect bearings particularly) are familiar to all users.

In our **"Cenco" Trip Scale** we have discarded the rough cast and forged iron parts, employing in place parts of brass and steel neatly formed by elaborate tools and machinery. All parts are, therefore, uniformly accurate and assemble with a degree of rigidity not possible heretofore.

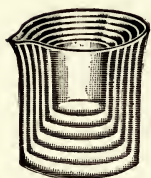
The bearings consist of hardened steel prisms resting on six agate shelves of large dimensions.

The graduated beam has a range of 10 grams in 1-10 gram divisions. Capacity is 2,000 grams.

Sensibility, after continued use, is guaranteed to be 1-10 gram.

Actual tests show much greater sensibility.....

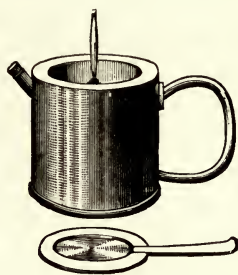
- | | | |
|-------|--|------|
| 3919. | Weights, brass, in block, 100 grams to 1 centigram | 6.65 |
| 3921. | Weights, brass, in block, 500 grams to 1 gram | .78 |
| 3923. | Weights, brass, in block, 1,000 grams to 1 gram | 1.77 |
| 3933. | Weights, iron, in nest, 1 kilo to 5 grams | 3.00 |
| | | 1.20 |



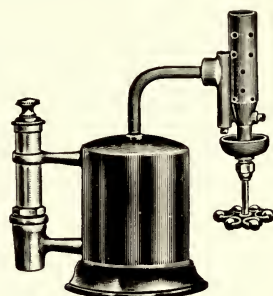
No. 4215.



No. 4441.

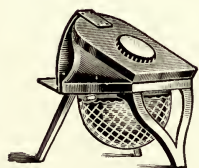


No. 4440.



No. 4456.

| | | |
|-------|---|--|
| 4215. | Beaker, Griffin form, lipped; of best annealed Bohemian glass. | |
| | No. | 000 00 0 1 2 3 4 5 6 7 |
| | Capacity, cc. | 30 50 75 130 230 350 550 750 1000 1400 |
| | Each\$ | 0.06 .08 .09 .10 .15 .20 .25 .33 .41 .50 |
| 4440. | Blast Lamp, Alcohol, of copper; upright blast..... | \$ 2.25 |
| 4441. | Blast Lamp, Bunsen's, the oldest and best blast lamp made..... | 3.30 |
| 4456. | Laboratory Blast Lamp, designed for general work where the laboratory is not equipped with gas. The Burner is rigid and is made of special bronze generator metal. It can be regulated from a small pointed flame to a large brush flame. The Tank is made of heavy seamless drawn brass fitted with patented automatic brass pump in handle..... | Net 3.25 |
| 4457. | Adjustable Laboratory Blast Lamp, fitted with adjustable stand and tripod. Complete | Net 5.00 |
| 4458. | Blast Lamp only of No. 4457..... | Net 3.25 |
| 4459. | Stand only of No. 4457..... | Net 2.00 |



No. 4241.



No. 4541.



No. 4543.



No. 4545.



No. 4547.

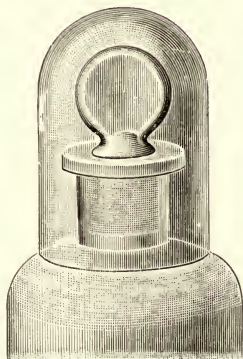


No. 4567.

| | | |
|-------|---|----------------------------------|
| 4241. | Blower or Foot Bellows, for blast lamps, brazing blow pipes, etc... | 5.00 |
| 4541. | Bottle, round flint "prescriptions," wide mouth for corks. | |
| | Capacity, ounces ... | 1 2 4 6 8 12 16 32 |
| | Per dozen..... | .26 .30 .42 .50 .60 .70 .90 1.30 |
| 4542. | Bottle, round green glass "prescriptions," wide mouth for corks. | |
| | Capacity, gallons | $\frac{1}{2}$ 1 2 |
| | Each | .20 .29 .67 |
| 4543. | Bottle, round flint glass "prescriptions," narrow mouth for corks. | |
| | Capacity, ounces ... | 1 2 4 6 8 12 16 32 |
| | Per dozen..... | .25 .28 .38 .45 .50 .70 .85 1.25 |
| 4544. | Bottle, round green glass "prescriptions," narrow mouth for corks. | |
| | Capacity, gallons | $\frac{1}{2}$ 1 2 |
| | Each | .18 .31 .60 |
| 4545. | Bottle, round flint "tinctures," mushroom stopper. | |
| | Capacity, ounces | 1 2 4 8 16 32 |
| | Per dozen | .80 1.00 1.25 1.50 2.10 2.75 |
| 4547. | Bottle, round flint glass "salt mouth," mushroom stopper. | |
| | Capacity, ounces | 1 2 4 8 16 32 |
| | Per dozen | 1.00 1.05 1.33 1.50 2.10 2.90 |
| 4567. | Bottle, Washing, with rubber stopper and flexible delivery tube. | |
| | Capacity, ounces | 8 12 16 24 32 |
| | Each | .33 .42 .45 .55 .65 |



No. 4587.



No. 4593.



No. 4589.

Bottles, Chemical Reagent. The labels on the bottles are of raised letters blown in the glass, the surface of each label being ground so as to render it distinct. The list will be found to contain the names of all the test solutions referred to in the United States Pharmacopoeia.

| | | |
|-------|---|---------|
| 4585. | Bottles, Reagent, 1 ounce, per dozen | \$ 1.40 |
| 4586. | Bottles, Reagent, 1 ounce, wide mouth, per dozen..... | 1.50 |
| 4587. | Bottles, Reagent, 4 ounce, per dozen | 1.95 |

No.

| | | |
|-----|----------------------------|---|
| 1. | Hydrogen Sulph. (Amber) .. | H ₂ S |
| 2. | Hydrochloric Acid | HCl |
| 3. | Acetic Acid | H ₃ C ₂ O ₂ |
| 4. | Sulphuric Acid | H ₂ SO ₄ |
| 5. | Nitric Acid | HNO ₃ |
| 6. | Potassium Ferrocyanide .. | K ₄ Fe(CN) ₆ |
| 7. | Potassium Sulphocyanide .. | KCNS |
| 8. | Potassium Carbonate | K ₂ CO ₃ |
| 9. | Potassium Sulphate | K ₂ SO ₄ |
| 10. | Potassium Iodide | KI |
| 11. | Potassium Ferricyanide .. | K ₃ Fe(CN) ₆ |
| 12. | Potassium Hydroxide | KOH |
| 13. | Potassium Dichromate | K ₂ Cr ₂ O ₇ |
| 14. | Sodium Phosphate | Na ₂ HPO ₄ |
| 15. | Ammonium Hydroxide | NH ₄ OH |
| 16. | Ammonium Sulph. (Amber) .. | (NH ₄) ₂ S |
| 17. | Ammonium Chloride | NH ₄ Cl |
| 18. | Ammonium Carbonate | (NH ₄) ₂ CO ₃ |
| 19. | Ammonium Oxalate | (NH ₄) ₂ C ₂ O ₄ |

No.

| | | |
|-------------|------------------------------|--|
| 20. | Barium Chloride | BaCl ₂ |
| 21. | Calcium Chloride | CaCl ₂ |
| 22. | Calcium Sulphate | CaSO ₄ |
| 23. | Calcium Hydroxide | Ca(OH) ₂ |
| 24. | Magnesium Sulphate | MgSO ₄ |
| 25. | Mercuric Chloride | HgCl ₂ |
| 26. | Silver Nitrate (Amber) | AgNO ₃ |
| 27. | Lead Acetate | Pb(C ₂ H ₃ O ₂) ₂ |
| 28. | Ferrous Sulphate | FeSO ₄ |
| 29. | Ferric Chloride | Fe ₂ Cl ₆ |
| 30. | Alcohol | C ₂ H ₅ OH |
| 31. | Ammon. Sulphocyanide .. | NH ₄ CNS |
| 32. | Barium Hydroxide | Ba(OH) ₂ |
| 33. | Barium Carbonate | BaCO ₃ |
| 35. | Ether | (C ₂ H ₅) ₂ O |
| 36. | Cupric Sulphate | CuSO ₄ |
| 38, 39, 40. | Blank. | |
| 59. | Sodium Carbonate | Na ₂ CO ₃ |
| 61. | Sodium Hydroxide | NaOH |

| | | |
|-------|---|------|
| 4588. | Bottles, Reagent. The above 40 bottles (including 3 blanks) packed in a box. Complete, per set..... | 6.50 |
| 4589. | Bottles, Reagent, 4 ounce, wide mouth, per dozen..... | 2.20 |
| 4590. | Bottles, Reagent, 8 ounce, per dozen | 2.50 |
| 4591. | Bottles, Reagent, 1 pint, per dozen..... | 3.60 |
| 4592. | Bottles, Reagent, 1 quart, per dozen..... | 4.45 |

For complete list of Reagent Bottles in all sizes see Catalogue M.

| | | |
|-------|--|------|
| 4593. | Caps, for Reagent Bottles. Will fit Nos. 4585-4586. Per dozen... | .75 |
| 4594. | Caps, for Reagent Bottles. Will fit Nos. 4587-4590. Per dozen... | .80 |
| 4595. | Caps, for Reagent Bottles. Will fit No. 4591. Per dozen..... | 1.00 |



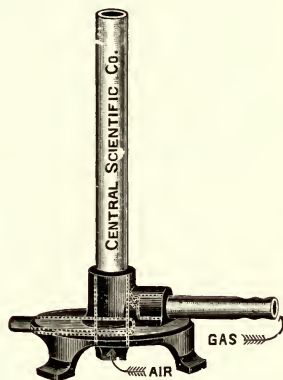
No. 4599.



No. 4600.



No. 4625.



No. 4627.

| | | |
|-------|---|----------------------------------|
| 4599. | Brush, Test Tube, plain, per dozen..... | \$ 0.40 |
| 4600. | Brush, Test Tube, brass wires, with sponge end, per dozen..... | .67 |
| 4601. | Brush, Beaker, wood handle | .22 |
| 4602. | Brush, Burette, and for long tubes..... | .10 |
| 4603. | Brush, Funnel, wood handle | .20 |
| 4604. | Brush, for small tubes, long wire handle, per dozen..... | .12 |
| 4605. | Brushes, camel hair pencils.....Small. Medium. Large. | |
| | Per dozen | .15 .20 .27 |
| 4606. | Brushes, camel hair, for scale pans, flat, wood handle. | |
| | Width | ½ inch. 1 inch. 1½ inch. 2 inch. |
| | Each | .15 .18 .22 .33 |
| 4625. | Burner, Bunsen's, with air regulator..... | .25 |
| 4627. | Burner, New Central Draft Burner. A new departure for students' use. Consists of only three pieces. No tip to clog up. Substances accidentally dropped into the tube will fall clear through to the table. Perfect combustion, long lived, inexpensive; each .20; per dozen | 2.00 |
| 4629. | Burner, Bunsen's, same as No. 4627, fitted with air damper. | |
| | Each, 22 cts.; per dozen..... | 2.50 |



No. 4621B.



No. 4621C.



No. 4621D.



No. 4621E.

| | | |
|--------|--|-----|
| 4621B. | Burner Attachment, Blow Pipe Tip, with rest \$ | .13 |
| 4621C. | Burner Attachment, Wing Top..... | .09 |
| 4621D. | Burner Attachment, Crown Top, giving round flame..... | .38 |
| 4621E. | Burner Attachment, Tripod | .18 |
| 4614. | Burettes, Mohr's, for use with pinchcock. | |
| | Size .....25cc.× $\frac{1}{16}$ 50cc.× $\frac{1}{16}$ 100cc.× $\frac{1}{16}$ | |
| | Each .... .67 1.00 1.80 | |
| 4614A. | Burettes, Mohr's, with glass stop cock. | |
| | Size .....25cc.× $\frac{1}{16}$ 50cc.× $\frac{1}{16}$ 100cc.× $\frac{1}{16}$ | |
| | Each 1.25 1.65 2.20 | |
| 4619. | Burette Float, Erdmann's | .25 |
| 4619A. | Burette Float, Erdmann's with points to prevent adherence to the side of the burette.. | .40 |



No. 4614. No. 4619.

6209. **Chamois Skins**, for cleaning instruments, etc.

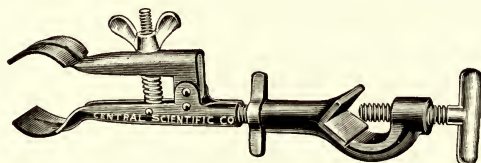
| | | | | |
|--------------------|--------|------|-------|-------|
| Size, inches | 6x8 | 9x11 | 10x13 | 14x18 |
| Price, each | \$0.09 | .17 | .22 | .45 |

5407. **Chemical Thermometer**, enclosed paper scale, tube 6-8 millimeters in diameter, 8 inches long, graduated to 110° C. \$ 0.405409. **Chemical Thermometer**, scale engraved on stem, white enameled back, tube 325 x 7 millimeters.

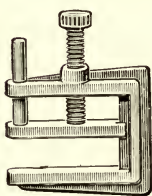
| | | | |
|------------------------|-------------|-------------|-------------|
| Centigrade scale | —10 to 110° | —10 to 210° | —10 to 360° |
| Price, each | .90 | 1.10 | 1.33 |

5409A. **Chemical Thermometer**, same as No. 5409, but with Fahrenheit scale

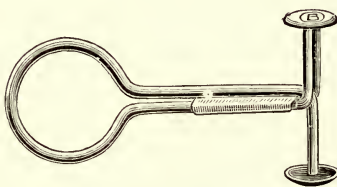
| | | | |
|------------------------|------------|------------|------------|
| Fahrenheit scale | 17 to 220° | 17 to 400° | 17 to 600° |
| Price, each | .90 | 1.10 | 1.33 |



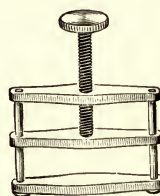
No. 4711.

4711. **Clamp, Burette**, with checknut to adjust to position; to attach to retort stand33

No. 4729.

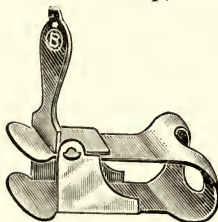


No. 4732.



No. 4735.

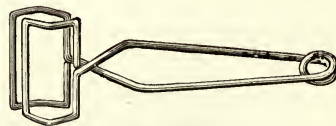
4729. **Clamp, Screw Compressor**, new form, of brass, nickel-plated; can be placed upon tubing without disconnecting apparatus; small..... .22
4730. **Clamp**, same as No. 4729; large..... .25
4732. **Clamp, Mohr's**, of brass, nickel-plated, for burettes, etc.; small... .09
4733. **Clamp, Mohr's**, same as No. 4732; medium..... .10
4734. **Clamp, Mohr's**, same as No. 4732; large..... .17
4735. **Clamp, Screw Compressor, Hoffmann's**; small..... .17
4736. **Clamp, Hoffmann's** same as No. 4735; large..... .22



No. 4737.

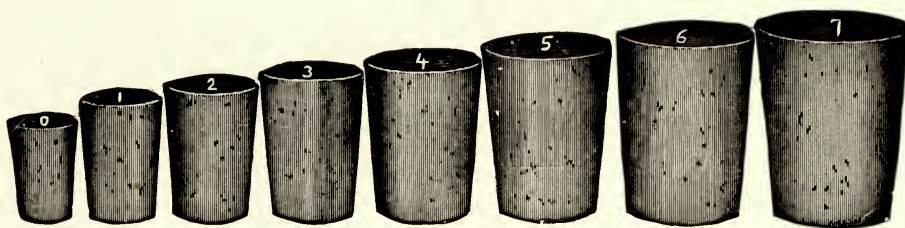


No. 4740.



No. 4741.

4737. **Clamp, Cut-off**, of brass, nickel-plated; small, per dozen..... .30
4738. **Clamp, Cut-off**, same as No. 4737; large, per dozen..... .50
4740. **Clamp, Test Tube**, of wood, improved form, with brass spring.... .08
4741. **Clamp, Test Tube, Stoddard's**, of spring brass wire..... .08
6215. **Cloth, Emery**. All numbers, per quire..... 1.20



No. 4775.

4775. Corks, Regular Length, XX quality. Diameters given are for the large end.

| | | | | | | | | | | | |
|-------------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|------|
| No. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Diam., inches ... | $\frac{3}{8}$ | $\frac{7}{16}$ | $\frac{1}{2}$ | $\frac{9}{16}$ | $\frac{5}{8}$ | $\frac{11}{16}$ | $\frac{3}{4}$ | $\frac{13}{16}$ | $\frac{7}{8}$ | $\frac{15}{16}$ | 1 |
| Per dozen | \$0.03 | .03 | .03 | .03 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
| Per gross | .15 | .17 | .17 | .21 | .23 | .30 | .33 | .45 | .55 | .65 | .80 |
| No. | 11 | 12 | 13 | 14 | 15 | 16 | 18 | 20 | 22 | 24 | 26 |
| Diam., in.. | $1\frac{1}{8}$ | $1\frac{1}{8}$ | $1\frac{3}{8}$ | $1\frac{1}{4}$ | $1\frac{5}{8}$ | $1\frac{3}{8}$ | $1\frac{1}{2}$ | $1\frac{5}{8}$ | $1\frac{3}{4}$ | $1\frac{7}{8}$ | 2 |
| Per dozen... | .10 | .11 | .12 | .14 | .16 | .18 | .22 | .30 | .35 | .45 | .55 |
| Per gross... | .90 | 1.00 | 1.05 | 1.20 | 1.35 | 1.65 | 1.95 | 2.20 | 2.90 | 3.50 | 4.00 |

4776. Corks, same as No. 4775. No. 0 to No. 11, assorted, in gross packages only \$ 0.50

Corks, Rubber, see Rubber Stoppers, page 81.

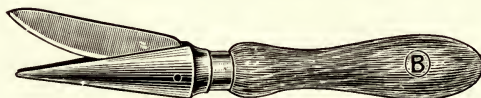
4778. Corks, Flat (Specie Corks), XX quality. Diameters given are for large end.

| | | | | | | | | | | | |
|--------------|---------------|----------------|----------------|----------------|---------------|----------------|----------------|----------------|---------------|----------------|---------------|
| Diam., in... | 1 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2 | $2\frac{1}{4}$ | $2\frac{1}{2}$ | $2\frac{3}{4}$ | 3 | $3\frac{1}{2}$ | 4 |
| Length, in.. | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{5}{8}$ | $\frac{5}{8}$ | $\frac{5}{8}$ | $\frac{3}{4}$ |
| Per dozen... | .08 | .11 | .15 | .20 | .25 | .33 | .44 | .60 | .70 | 1.00 | 1.40 |



No. 4781.

4779. Cork Borer, smallest size ($\frac{3}{8}$ inch), with punch..... .22
 4780. Cork Borer, brass, with punch, set 1-3..... .55
 4781. Cork Borer, brass, with punch, set 1-6..... .90
 4782. Cork Borer, brass, with punch, set 1-9..... 1.50
 4783. Cork Borer, brass, with punch, set 1-12..... 2.05
 4784. Cork Borer, brass, with punch, set 1-15..... 3.35

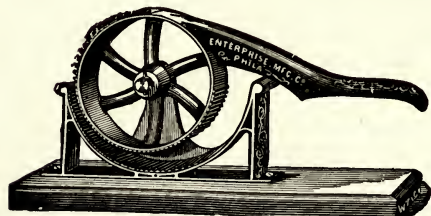


No. 4788.



No. 251.

4788. Cork Borer Sharpener. Steel cone with knife..... 1.00
 251. Cork Knife. Good steel blade 4 inches long. Round wood handle. .20



No. 4790.



No. 4791.

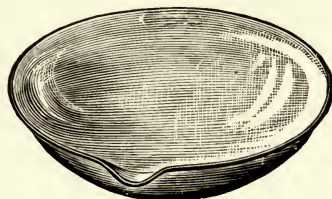


No. 4793.

4790. Cork Press, wheel form..... .62
 4791. Cork Press, flat form, cast iron..... .22
 4793. Corkscrew, wood handle..... .10
 4795. Corkscrew, twisted wire, per dozen..... .11



No. 4845.



No. 4847.

4845. **Dish, Crystallizing**, of light glass, with flat bottom and straight sides.
 Diameter, inches . . . 2 3 4 5 6 8 10
 Each \$0.10 .15 .22 .30 .40 .67 1.00

4847. **Dish, Evaporating**, of German porcelain, glazed inside.
 No. 9 8 7 6 5 4 3 2 1
 Diam., inches, approx. 2½ 3 3½ 4 4½ 5 5½ 6 6¼
 Capacity, ounces 1 2 2½ 3½ 6 7½ 10 13 16
 Each11 .13 .17 .19 .22 .27 .30 .40 .50

4881. **Filter Paper**. A pure white paper of superior quality, strong and rapid; for qualitative work; cut in round filters, 100 in a package.
 Diameter, cm. 7.5 10 12.5 15 20 25 33
 Price, per package10 .12 .15 .20 .30 .45 .60

4882. **Filter Paper**, same quality as No. 4881, in sheets 48 x 48cm.
 Per quire40 Per ream 6.65

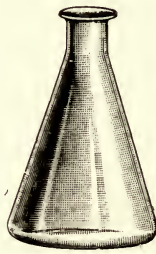
4885. **Filter Paper, Munktell's Swedish, No. 1 F**, for quantitative work. The most perfect filters made. Of best linen material, cut round. 100 filters in a package; 5 packages enclosed in a birch-bark box.
 Diameter, cm. 5.5 7 9 11 12.5 15
 Price, per package11 .16 .25 .30 .40 .50



No. 4901.



No. 4902.



No. 4903.



No. 4910.

4901. **Flasks, best German glass, flat bottom**.
 Capacity, ozs. 2 4 6 8 12 16 24 32 64
 Price, each08 .09 .10 .13 .14 .18 .22 .27 .45

4902. **Flasks, best German glass, round bottom**.
 Capacity, ozs. 2 4 6 8 12 16 24 32 64
 Price, each08 .09 .10 .13 .14 .18 .22 .27 .45

4903. **Flasks, best German glass, Erlenmeyer's form**.
 Capacity, ounces 2 4 6 8 12 16 32
 Price each08 .09 .11 .14 .16 .18 .30

4909. **Flasks, Volumetric**, or litre flasks, volume fixed with one mark on the neck, very accurate.
 Capacity, c. c. 100 250 500 1000
 Price, each25 .35 .50 .63

4910. **Flasks, Volumetric**, same as No. 4909, with ground glass stopper.
 Capacity, c. c. 100 250 500 1000
 Price, each30 .50 .67 .75



No. 4921.



No. 4922.



No. 4923.



No. 4926.



No. 4927.

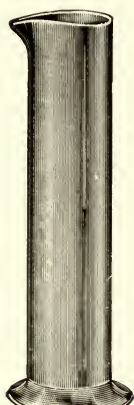


No. 4928.

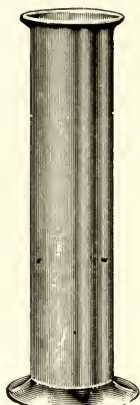
4921. **Funnel, glass, angle of 60°, stem ground to a point.**
 Diameter, inches 2. 2½ 3 3½ 4 5 6 8
 Each \$0.08 .09 .12 .14 .16 .20 .22 .38
4922. **Funnels, Separatory, ordinary shape, 60°.**
 Diameter, inches 4 6
 Price, each 1.25 1.65
4923. **Funnels, Separatory, light glass, globe shape, with glass stopper, stop-cock and long stem.**
 Capacity, cc. 50 100 150 250
 Price, each90 1.10 1.25 1.35
4924. **Funnels, Separatory, cylindrical; capacity, 50cc.** \$ 0.84
4926. **Funnel Tube, thistle top, straight stem.**08
4927. **Funnel Tube, thistle top, bent safety stem.**17
4928. **Funnel Tube, thistle top, one bulb safety stem.**18
4933. **Funnels, Agateware.**
 Capacity ½ pint. 1 pint. 1 quart.
 Price, each27 .33 .40
4973. **Gauze Wire, Iron, to put under dishes.**
 Size 4x4 5x5 6x6 sq. ft.
 Each04 .06 .07 .27
4975. **Gauze, Wire, Brass, to put under dishes.**
 Size 4x4 5x5 6x6 sq. ft.
 Each08 .12 .15 .50
4977. **Gauze, Wire, Copper, for combustion, etc.**
 Mesh 40 60 80 100
 Per sq. ft.55 .67 .90 1.80
4981. **Glass Tubing, best German soft glass, in five foot lengths, sizes ¼ to 1 inch, per lb.**44
4982. **Glass Tubing, best German soft glass, sizes 1¼, 1½, 1¾, 2 inches; per lb.**60
- 4980A. **Glass Stirring Rods, with rounded ends.**
 Size 5x3¼ 8x¼ 10x¼
 Per dozen16 .33 .50
5001. **Graduate, Cylindrical, German. Double graduation, so that the divisions may be read up or down.**
 Capacity, cc. .. 10 25 50 100 200 250 500 1000
 Each27 .35 .45 .56 .75 .80 1.05 2.00
5003. **Graduate Cylindrical, same as No. 5001, with glass stopper.**
 Capacity, cc. 50 100 250 500 1000
 Each60 .76 1.05 1.50 2.25
5007. **Graduate, glass, cone shape, metric measure.**
 Capacity, cc. 30 60 100 200 250 500
 Each25 .28 .33 .40 .55 .83
5009. **Graduate, glass, cone shape, metric and English measure, double graduation.** Capacity, ounces.. 1 2 3 6 8 16
 Capacity, cc. 30 60 100 200 250 500
 Each30 .37 .45 .55 .65 1.00
6241. **Glue, LePage's** Bottle Can
 Size Small Large 2 oz. 4 oz. 8 oz. 1 lb.
 Each15 .22 .22 .28 .40 .65



No. 5001.



No. 1125.



No. 1127.



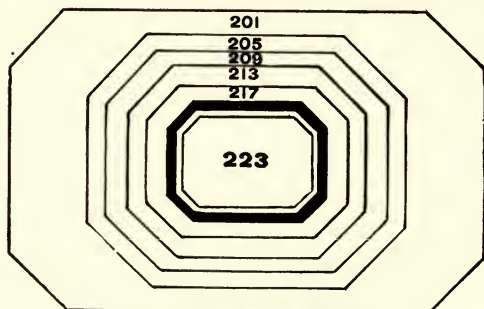
No. 5025.



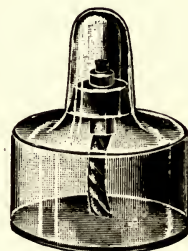
Nos. 1355 to 1359.

| | | | | | | |
|-------|---|--------|-----|-----|-----|---------|
| 1125. | Jars, Hydrometer, with lip. Height in. | 10 | 12 | 15 | 15 | 18 |
| | Diameters, inches | 1½ | 2 | 2 | 3 | 3 |
| | Price, each | \$0.30 | .38 | .50 | .83 | 1.10 |
| 1127. | Jars, Hydrometer, with flange, same sizes and prices as No. 1125. | | | | | |
| 5025. | Jars, Waste, stoneware. These jars have handles and covers, and are preferable to a galvanized iron can for the refuse from the laboratory. | | | | | |
| | Capacity, gallons | ½ | 1 | 2 | 4 | 6 |
| | Price, each | .33 | .45 | .50 | .95 | 1.40 |
| 1355. | Jars, Bell Glass, straight form, knob top, ground flange, ½ gal. | | | | | \$ 0.95 |
| 1357. | Jars, Bell Glass, straight form, knob top, ground flange, 1 gal. | | | | | 1.20 |
| 1359. | Jars, Bell Glass, straight form, knob top, ground flange, 2 gal. | | | | | 1.65 |
| 1360. | Jars, Bell Glass, straight form, knob top, ground flange, 3 gal. | | | | | 2.25 |
| | N. B.—No. 1360 Bell Glass will cover any Microscope. | | | | | |
| 1379. | Jars, Bell Glass, low form, knob top, ground flange, 4 inch. | | | | | .60 |
| 1381. | Jars, Bell Glass, low form, knob top, ground flange, 6 inch. | | | | | 1.00 |
| 1383. | Jars, Bell Glass, low form, knob top, ground flange, 8 inch. | | | | | 1.40 |

Museum and Specimen Jars on page 47.



No. 5035.



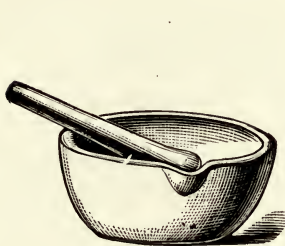
No. 5045.

| | | | | | | | | | |
|-------|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 5035. | Labels, red border, gummed. | | | | | | | | |
| | Number | 223 | 217 | 213 | 209 | 205 | 201 | 261 | 259 |
| | Per box | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |

Note—Nos. 201, 205, 209, 213, 217 and 223 are shown full size in cut. No. 219 measures 18 x 40mm., No. 259 measures 14 x 33mm., No. 261 measures 15 x 50mm.

Labels for Glass Slides, see page 29.

| | | | |
|-------|---|-----|-----|
| 5045. | Lamps, Alcohol, glass, with ground cap, wick and wick holder. | | |
| | Size, ounces | 4 | 8 |
| | Price, each | .25 | .40 |
| 5049. | Lamps, Alcohol, brass, with cap and wick. | | |
| | Size, ounces | 2 | 4 |
| | Price, each | .45 | .50 |



No. 5073.



No. 5075.



No. 5077.

5071. **Mortars, Iron, vase shape, heavy, with pestle.**
Capacity 1 pt. 1 qt. ½ gal. 1 gal.
Price, each\$0.50 .65 1.10 1.65
5073. **Mortars, Porcelain, shallow form, with pestle.**
Number 6 5 4 3 2 1
Diameter, inches 2¾ 3¼ 4 4½ 5½ 6
Price, each33 .42 .48 .63 .75 .90
5075. **Mortars, Wedgewood, acid proof, with pestle.**
Number .. 0000 000 00 0 1 2 3 4 5 6
Diam., in.. 2¾ 3 3½ 3¾ 4½ 5 5½ 6 6½ 7
Price, each .33 .40 .50 .55 .60 .67 .83 1.00 1.30 1.65
5077. **Mortars, Glass, with pestle.**
Capacity, ounces 2 4 8 16
Price, each22 .25 .33 .50
5103. **Pencils, Wax. For marking data upon glass, blue, each..... \$ 0.17**



No. 5111.



No. 5113.

5111. **Pipettes, Medicine Droppers, rubber bulb, per dozen..... .30**
5113. **Pipettes, round bulb..... .11**
5117. **Pipettes, long bulb, small..... .09**
5119. **Pipettes, long bulb, large..... .10**
5131. **Plates, Glass, ground on one side, for covering jars, etc.**
Size, inches 2x2 3x3 4x4 6x6 8x8 10x10
Each04 .05 .06 .09 .15 .25
5133. **Plates, Porcelain, with cavities, for color reaction, each..... .40**
5213. **Rubber Stoppers, made from the best quality of rubber, especially for chemical laboratory use, and will not harden from age. Each size furnished in three styles—solid, one hole or two holes. Per lb. 1.75**

Table Showing Approximate Number of Rubber Stoppers in One Pound.

| Number | | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----------------------------|--------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Diameter large end, mm..... | | 14 | 17 | 18 | 20 | 23 | 25 | 27 | 32 | 37 | 41 | 45 | 50 | 56 | 65 | 72 |
| Diameter small end, mm..... | | 9 | 12 | 15 | 16 | 18 | 20 | 23 | 26 | 30 | 33 | 37 | 42 | 50 | 59 | 68 |
| Approximate | Solid | 150 | 76 | 58 | 53 | 40 | 32 | 26 | 20 | 15 | 12 | 11 | 8 | 6 | 5 | 4 |
| Number in | 1 hole | 160 | 82 | 60 | 55 | 42 | 33 | 27 | 21 | 15 | 12 | 11 | 8 | 6 | 5 | 4 |
| One Pound | 2 hole | 175 | 85 | 63 | 58 | 44 | 34 | 28 | 22 | 16 | 13 | 12 | 9 | 6 | 5 | 4 |

5215. **Rubber Tubing, White, best quality, hand made, in 12 foot lengths.**
Inside diameter, inches..... ⅛ ⅜ ¼ ⅝ ¾ 1½
Price, per foot05 .07 .10 .11 .13 .22
5219. **Rubber Tubing, Red, Antimony rubber, in 12 foot lengths.**
Inside diameter, inches..... ⅛ ⅜ ¼ ⅝ ¾ 1½
Price, per foot06 .09 .13 .17 .22 .30
5221. **Rubber Tubing, Black, pure gum, in 12 foot lengths.**
Inside diameter, inches..... ⅛ ⅜ ¼ ⅝ ¾ 1½
Price, per foot06 .10 .14 .18 .22 .33



No. 5237.

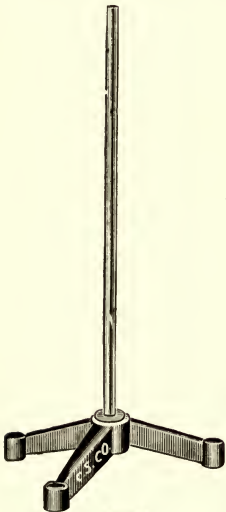


No. 5203.

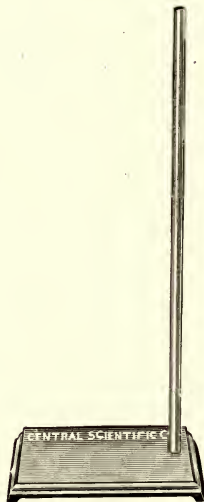


No. 5265.

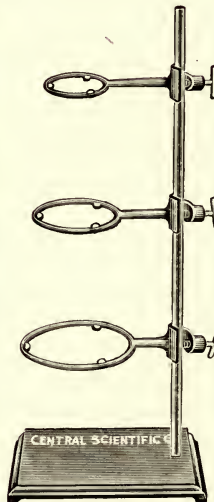
| | | | | | | |
|--------|---|--------|-----|-----|-----|---------|
| 5237. | Sand Bath, best Russia sheet iron, shallow form. | | | | | |
| | Diameter, inches | 3 | 4 | 5 | 6 | |
| | Price, each | \$0.08 | .10 | .11 | .15 | |
| 6275. | Sealing Wax, best red, four sticks to the pound, per pound | | | | | \$ 0.44 |
| 6291. | Sponges. Natural, for cleaning purposes, 16 to a pound, per pound | | | | | 2.20 |
| 5261. | Spatulas, Glass, 6 inch | | | | | .11 |
| 5263. | Spatulas, Horn, double end. | | | | | |
| | Length, inches | | | 4 | 6 | |
| | Price, each | | | .09 | .16 | |
| 5265. | Spatulas, Steel, wooden handle. | | | | | |
| | Length of blade, inches | | 3 | 4 | 5 | 6 |
| | Price, each | | .22 | .27 | .30 | .42 |
| 5271. | Spoons, Horn, superior quality with spatula end. | | | | | |
| | Length, inches | | | 4 | 6 | |
| | Price, each | | | .11 | .17 | |
| 5273. | Spoon, Glass, teaspoon | | | | | .20 |
| 5273A. | Spoon, Glass, tablespoon | | | | | .45 |



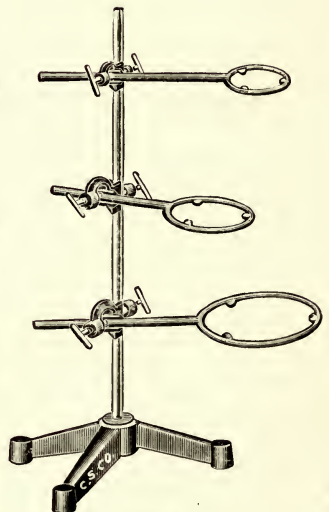
No. 5325.



No. 5327.



No. 5329.

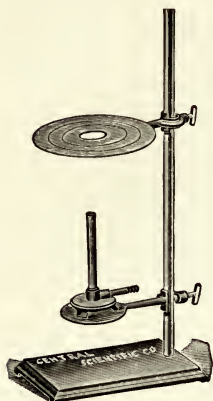


No. 5329 A.

Supports, iron base and coppered steel rod.

| Cat. No. | Size of Rod. | | 18x $\frac{5}{8}$ | 20x $\frac{3}{8}$ | 24x $\frac{1}{2}$ | 36x $\frac{1}{2}$ |
|----------|-------------------|-------|-------------------|-------------------|----------------------------|-------------------|
| 5325 | Tripod Base, size | | Small | Medium | Large | Extra large |
| | Price with Rod | | .30 | .40 | .62 | .85 |
| 5327 | Rect. Base, size | | No. 1 (5x8) | No. 2 (5x8) | No. 3 (5 $\frac{1}{2}$ x9) | No. 4 (6x11) |
| | Price with Rod | | .25 | .33 | .55 | .85 |
| 5329 | Rect. Base | Rings | 3 & 4 inch | 3.4 & 5 in | 3, 4, 5 & 6 in | 3, 4, 5 & 7 in. |
| | with Rod & Rings | Price | .45 | .60 | .85 | 1.25 |

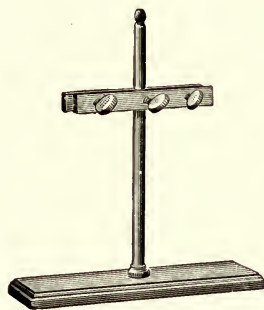
5329A. Illustration shows No. 5325 Support with No. 5203 Extension Rings in connection with No. 4723 Clamp Holders.



Nos. 5204-5331.



No. 5357.



No. 5347.

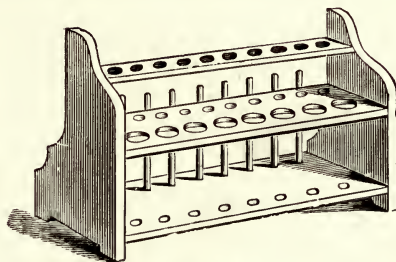
5331. Platform, of iron, 3½ inches in diameter, with heavy screw for clamping on supports or tripods. Useful for supporting burners, etc. \$ 0.25
5204. Rings, Concentric, six inches in diameter with two removable rings, with heavy screw for clamping on supports for supporting water baths, sand baths, flasks, etc. .33
5357. Funnel Holder, for use with supports. Made of hardwood with four beveled openings for 60° funnels. Will center over rings. Without support .45
5347. Support, Burette, of hardwood, for two burettes, cork lined. .1.10



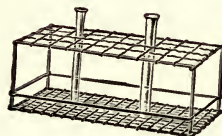
No. 5375.



No. 5377.



Nos. 5379-81.



No. 5383.

5375. Support, Test Tube, for 6 tubes. Heavy base with drying pins. .25
5377. Support, Test Tube, for 10 tubes. Heavy base with drying pins. .33
5379. Support, Test Tube, for 13 tubes. Two rows of holes with drying pins. .42
5381. Support, Test Tube, for 25 tubes. As used at the University of Chicago. Two rows of holes with drying pins. .67
5383. Support, Test Tube, of wire. Will hold 40 tubes. Size 9½ inches long by 4½ inches wide by 3½ inches high. .33

5102. Test Paper, Litmus, blue, per sheet, .04; per quire. .67
5102. Test Paper, Litmus, red, per sheet, .04; per quire. .67

5395. Test Tubes, well annealed and guaranteed.

| | | | | | |
|--------------|------|------|------|------|-------|
| Size, inches | 3x¾ | 4x½ | 5x½ | 5x⅝ | 6x⅝ |
| Per dozen | .15 | .20 | .22 | .25 | .28 |
| Per gross | 1.45 | 1.90 | 2.00 | 2.25 | 2.50 |
| Size, inches | 6x¾ | 7x¾ | 8x1 | 10x1 | 12x1 |
| Per dozen | .30 | .40 | .45 | .80 | 1.25 |
| Per gross | 2.75 | 3.80 | 5.00 | 9.00 | 12.00 |

5396. Test Tubes, assorted sizes from 3 to 7 inch; per dozen. .26

5399. Test Tubes, on foot; size, in. 4 5 6 8 10
Per dozen .60 .75 .85 1.25 1.65



No. 5399.

MICROSCOPIC STAINS AND REAGENTS.

In Original Packages Prepared by
DR. GEO. GRUEBLER & CO., LEIPZIG.

DRY COLORS.

| | PRICES NET. | | |
|--|-------------|---------|---------|
| | 1 Grm. | 10 Grm. | 25 Grm. |
| Acid, Brown | \$1.00 | \$0.25 | \$0.60 |
| Acid, Carminic Ha. | .20 | 1.90 | .... |
| Acid, Fuchsin (Fuchsin S) | | .30 | .65 |
| Acid, Violet | | .35 | .85 |
| Aethyl Violet | | .35 | .75 |
| Alizarine Blue S. (Ehrlich) | | .30 | .65 |
| Alizarine Sulfonate Sodium | | .35 | .75 |
| Alkali Blue | | .35 | .75 |
| Alkanin, fat soluble | | .35 | .65 |
| Aniline Blue, alc. soluble | | .35 | .80 |
| Aniline Blue, water soluble | | .35 | .75 |
| Aniline Blueblack | | .35 | .85 |
| Aniline Green (Strasburger) | | .30 | .70 |
| Aniline Yellow | | .25 | .60 |
| Auramine | | .30 | .70 |
| Aurantia | | .45 | 1.10 |
| Azoblue | | .35 | .80 |
| Azur I (Giemsa) | 2.50 | .... | .... |
| Azur II (Giemsa) | 1.25 | .... | .... |
| Azur II, Eosine (Giemsa) | 1.90 | .... | .... |
| Benzoazurine | | .35 | .75 |
| Benzopurpurine (Birch-Hirschfeld) | | .30 | .75 |
| Biebrich Scarlet | | .30 | .65 |
| Biondi-Ehrlich-Heidenhain's 3 color mixture, dry | .15 | 1.45 | 3.65 |
| Bismarck Brown (Weigert) | | .20 | .45 |
| Bleu de Lyon (Griesbach) | | .30 | .70 |
| Bordeaux R. (Griesbach) | | .30 | .70 |
| Brasilin | .25 | 2.25 | .... |
| Brilliant Green | | .30 | .70 |
| Carmalum, dry | | .60 | 1.45 |
| Carmine rubr. opt. | | .45 | 1.00 |
| Carminate Ammonium | .25 | 2.00 | .... |
| Carminate Sodium | .25 | 2.00 | .... |
| China Blue | | .35 | .85 |
| Chrysoidin | | .25 | .60 |
| Congored (Nissel) | | .35 | .75 |
| Corallin, alc. soluble | | .25 | .60 |
| Corallin, water soluble | | .25 | .60 |
| Crystal Violet | | .30 | .70 |
| Crocein (Griesbach) | | .30 | .70 |
| Curcumein N. | | .20 | .50 |
| Cyanin | .75 | 7.00 | .... |
| Dahlia | | .30 | .65 |
| Diamond Fuchsin | | .35 | .65 |
| Echt Green Platner (Dinitroresorcin) | | .30 | .... |
| Emerald Green | | .30 | .70 |
| Eosine, A. G. | | .35 | .80 |
| Eosine, B. A. | | .30 | .70 |
| Eosine, water soluble, yellowish | | .30 | .65 |
| Eosine, water soluble, bluish | | .25 | .55 |
| Eosine, alc. soluble | | .30 | .70 |
| Eosine, Methylene Blue | .20 | 1.65 | .... |
| Erythrosine, pure | | .45 | 1.00 |
| Fluoresceine (Czaplewsky, Kühne) | | .45 | 1.00 |
| Fuchsin, f. bacill. | | .25 | .60 |
| Fuchsin S. (Acid Fuchsine) (Weigert) | | .30 | .65 |
| Gentian Violet (Gram) etc. | | .25 | .60 |
| Hemalum, dry | | .60 | .... |

DRY COLORS—Continued.

Prices Net.

1 Grm. 10 Grm. 25 Grm.

| | | | |
|--|--------|--------|--------|
| Hematein, purest | \$0.35 | \$3.25 | \$.... |
| Hematein—Aumon., purest (P. Mayer) | .35 | 3.00 | .... |
| Hematoxylin, purest, cryst. .... | .... | .65 | 1.50 |
| Hofmann's Violet ..... | .... | .35 | .85 |
| Indigo-Carmine, dry ..... | .... | .45 | 1.00 |
| Indulin ..... | .... | .35 | .80 |
| Iodine Green (Substitute) (Griesbach) etc. .... | .... | .50 | 1.10 |
| Jenner's Stain, dry. | .20 | 1.65 | .... |
| Light Green, F. S. (Benda) ..... | .... | .25 | .60 |
| Magdala Red, true. | .45 | .... | .... |
| Magdala Red, com'l. .... | .... | .40 | .... |
| Magenta Red ..... | .... | .35 | .85 |
| Malachite Green ..... | .... | .30 | .70 |
| Martius Yellow ..... | .... | .25 | .60 |
| Metanil Yellow, cryst. (Griesbach) ..... | .... | .30 | .70 |
| Methyl Blue ..... | .... | .40 | .95 |
| Methyl Eosine ..... | .... | .40 | .90 |
| Methyl Green ..... | .... | .40 | .90 |
| Methyl Green, O. O. Yellowish. .... | .... | .50 | 1.20 |
| Methyl Orange ..... | .... | .25 | .55 |
| Methyl Violet, 1B. .... | .... | .35 | .75 |
| Methyl Violet, 2B. .... | .... | .25 | .60 |
| Methyl Violet 5B. .... | .... | .30 | .70 |
| Methyl Violet, 6B. .... | .... | .35 | .85 |
| Methylene Blue, f. bacill. (Koch) ..... | .... | .30 | .65 |
| Methylene Blue, B. X. (Siegm. Mayer) ..... | .... | .45 | 1.10 |
| Methylene Blue, Medic. pure (Guttm. and Ehrl.) ..... | .... | .50 | 1.20 |
| Methylene Green ..... | .... | .40 | .95 |
| Mucicarmine, dry (P. Mayer) | .30 | .... | .... |
| Muchamatein (P. Mayer) | .45 | .... | .... |
| Naphthaline Red, pure. | .50 | 4.75 | .... |
| Naphtylamine Brown (Kaiser) ..... | .... | .25 | .60 |
| Naphtylamine Yellow (Naphtol Yellow) ..... | .... | .25 | .60 |
| Nigrosine ..... | .... | .25 | .60 |
| Nile Blue Hydrochloride. .... | .... | .45 | .... |
| Nile Blue Sulfate ..... | .... | .40 | .... |
| Orange G. .... | .... | .20 | .50 |
| Orcein, pure (Israel & Unna) | .20 | 1.60 | .... |
| Picro Carmine, dry (Cuccati) | .25 | .... | .... |
| Picro Carmine, dry (Hoyer) | .25 | .... | .... |
| Picro Carmine, dry (Ranvier) | .25 | .... | .... |
| Ponceau P. R. .... | .... | .25 | .60 |
| Purpurin, dry, best. | .45 | 4.25 | .... |
| Pyronin (Pappenheim) ..... | .... | .40 | .90 |
| Rosaniline Base ..... | .... | .45 | .... |
| Rosaniline Hydrochloride ..... | .... | .30 | .75 |
| Rosaniline Violet (Hanstein) ..... | .... | .50 | .... |
| Rose Bengal (Griesbach) ..... | .... | .40 | .95 |
| Red Violet, 5 RS (Unna) ..... | .... | .30 | .70 |
| Rubin S ..... | .... | .30 | .65 |
| Ruthenium Red (Mangin). Per $\frac{1}{10}$ grm. | \$1.50 | .... | .... |
| Safranin O, water soluble (Pfitzner, Fleming) ..... | .... | .35 | .80 |
| Safranin, alc. soluble. .... | .... | .40 | .95 |
| Safranin, pure (Phenosafranine) ..... | .... | .40 | .... |
| Scarlet R. (Michaelis) ..... | .... | .35 | .80 |
| Spiller's Purple | .65 | .... | .... |
| Sudan III, fat soluble (Daddi) ..... | .... | .30 | .65 |
| Thionin, pure (Ehrl., Hoyer, Heidenh.) | .20 | 1.50 | 3.50 |
| Toluidin Blue (Hoyer) ..... | .... | .35 | .85 |
| Tropaeolin OOO ..... | .... | .25 | .... |
| Uranin ..... | .... | .35 | .85 |
| Vesuvium Brown (Koch) ..... | .... | .25 | .60 |
| Victoria Blue, 4 R. (Lustgarten) ..... | .... | .40 | .90 |
| Water Blue (Unna) etc. .... | .... | .35 | .85 |
| Wool Black (Loeffler) ..... | .... | .25 | .60 |
| Wright's Stain, dry | .40 | 3.75 | .... |

Dry Stains and Coloring Masses for Injections.

| | | Prices Net. |
|--|---------------------|-------------|
| Berlin Blue Ia, for coloring injection-masses..... | Per 10 gram vial | \$ 0.30 |
| Indigo Carmine, opt. Ia, for Kidney injection..... | Per 1 gram vial | .35 |
| Methylene Blue, rectified for injection in vitals (Ehrlich) .. | Per 1 gram vial | .25 |
| Neutral Red, for injection in vitals (Ehrlich)..... | Per 1 gram vial | .15 |
| Beale's Injectionmass, fluid, red..... | Per 100 gram bottle | .50 |
| Beale's Injectionmass, fluid, blue..... | Per 100 gram bottle | .50 |
| Gelatine Injectionmass, blue..... | Per 100 gram bottle | .40 |
| Gelatine Injectionmass, red (Spaltholz)..... | Per 100 gram bottle | .50 |
| Gelatine Injectionmass, yellow (Ackermann)..... | Per 100 gram bottle | .50 |

Staining Material in Solution.

(Dr. Gruebler's Dry Colors Used.)

| | 1 oz. | 4 oz. | 8 oz. |
|--|--------|--------|-------|
| Aceto-Carmine (Schneider)..... | \$0.35 | \$0.60 | \$... |
| Acid, Hemalum | .20 | .45 | ... |
| Alizarine, aqueous solution..... | .15 | .35 | .65 |
| Alkanin, alcoholic solution..... | .15 | .35 | .65 |
| Alum Carmine (Grenacher)..... | .20 | .45 | .75 |
| Alum Carmine, acetic acid (Henneguy)..... | .25 | .50 | ... |
| Ammonia Carmine (Beale)..... | .15 | .35 | .65 |
| Aniline Blue, alcoholic solution..... | .20 | .45 | ... |
| Aniline Blueblack | .20 | .45 | ... |
| Aniline Green | .20 | .45 | ... |
| Aniline Red | .20 | .45 | ... |
| Aniline Violet | .20 | .45 | ... |
| Aniline Water | ... | .35 | .65 |
| Aniline Water, Gentian Violet, (Gram's)..... | .20 | .45 | .75 |
| Benzoazurin | .20 | .45 | ... |
| Biondi-Ehrlich-Heidenhain's Triple Mixture | .35 | 1.15 | ... |
| Bismarck Brown | .20 | .45 | .75 |
| Bismarck Brown (Weigert)..... | .25 | .50 | ... |
| Borax Carmine (Grenacher)..... | .20 | .45 | .75 |
| Bordeaux Red | .20 | .45 | ... |
| Carbol-Fuchsin (Ziehl-Nielsen) | .20 | .50 | .75 |
| Carbol-Thionin | .35 | .90 | 1.35 |
| Carmalum (Mayer) | .20 | .50 | .85 |
| Chenzinsky-Plehn Mixture | .20 | .50 | ... |
| Cochineal Tincture (Mayer)..... | .25 | .50 | ... |
| Congo Red | .20 | .45 | .75 |
| Cyanine | 1.00 | ... | ... |
| Dahlia | .20 | .50 | ... |
| Delta Purpurino | .20 | .45 | ... |
| Eosin, alcoholic solution..... | .25 | .50 | 1.00 |
| Eosin, Bluish, aqueous solution..... | .25 | .50 | 1.00 |
| Eosin, Yellowish, aqueous solution..... | .20 | .45 | 1.00 |
| Eosin, Methylene Blue (Chenzinsky)..... | .55 | 1.00 | ... |
| Fuchsin, alcoholic solution..... | .30 | .65 | ... |
| Fuschin, Acid, aqueous solution..... | .20 | .40 | ... |
| Gabbett's Bacillus Stain, No. 1..... | .20 | .50 | ... |
| Gabbett's Bacillus Stain, No. 2..... | .20 | .50 | ... |
| Gentian Violet | .20 | .50 | ... |
| Gibbe's Double Stain for bacilli..... | .50 | 1.00 | ... |
| Giemsa's Stain for malarial parasites..... | .60 | 1.90 | ... |
| Gram's Solution, No. 1 (Gentian Violet)..... | .20 | .45 | .75 |
| Gram's Solution, No. 2 (Iodine)..... | .15 | .40 | .65 |
| Glycerine-Alum Hematein (Mayer)..... | .35 | .65 | ... |
| Gold Orange | .20 | .40 | ... |
| Hemacalcium, Alcohol (Mayer)..... | .30 | .50 | ... |
| Hemalum (Mayer)..... | .25 | .50 | ... |
| Hematoxylin (Böhrer's) | .25 | .50 | ... |
| Hematoxylin (Delafield's) | .25 | .50 | .75 |
| Hematoxylin (Ehrlich's) Acid..... | .25 | .50 | .75 |
| Hematoxylin (Grenacher's) | .25 | .50 | .75 |
| Hematoxylin (Hansen's) | .25 | .50 | ... |
| Hematoxylin (Heidenhain's) Iron No. 1..... | .20 | .40 | ... |
| Hematoxylin (Heidenhain's) Iron No. 2..... | .30 | .50 | ... |

STAINING SOLUTIONS—Concluded.

| | 1 oz. | 4 oz. | 8 oz. |
|---|--------|--------|--------|
| Hematoxylin (Weigert's) Solution No. 1, for medullated nerve fibers | \$0.30 | \$0.50 | \$.... |
| Hematoxylin (Weigert's) Solution No. 2, for medullated nerve fibers | .30 | .50 | .... |
| Indulin | .25 | .50 | .... |
| Iodine, Green | .25 | .50 | 1.00 |
| Iodine, Solution (Gram's)..... | .25 | .50 | .... |
| Iodine, Tincture | .20 | .55 | 1.00 |
| Iodine and Potassium, Iodide Solution..... | .25 | .75 | .... |
| Jenner's Blood Stain..... | .35 | .90 | 1.35 |
| Leischman's Blood Stain..... | .35 | .90 | 1.35 |
| Loeffler's Flagelli Stain..... | .20 | .40 | .75 |
| Loeffler's Alkaline, Methylene Blue, for bacilli..... | .25 | .50 | .... |
| Magenta Red | .20 | .40 | .75 |
| Magenta, Acid | .25 | .50 | .... |
| Malachite Green | .20 | .40 | .75 |
| Mallory's Connective Tissue Stain..... | .25 | .50 | .... |
| Methyl Blue | .30 | .55 | .90 |
| Methyl Green..... | .30 | .55 | .90 |
| Methyl Violet 5B, aqueous solution..... | .30 | .55 | .... |
| Methylene Blue, alcoholic solution..... | .30 | .50 | .90 |
| Methylene Blue (Gabbett's) Acid..... | .25 | .50 | .... |
| Methylene Blue (Loeffler's) Alkaline..... | .20 | .50 | .... |
| Methylene Blue (Unna's) Polychromatic..... | .50 | .90 | .... |
| Muchematein (Mayer) | .25 | .50 | .... |
| Mucicarmine (Mayer) | .25 | .50 | .... |
| Neisser's Stain for diphtheria diagnosis No. 1..... | .25 | .50 | .... |
| Neisser's Stain for diphtheria diagnosis No. 2..... | .25 | .50 | .... |
| Nigrosin, aqueous solution..... | .20 | .40 | .... |
| Orange G, aqueous solution..... | .20 | .40 | .75 |
| Orcein, Acid (Unna)..... | .25 | .50 | .... |
| Paracarmine (Mayer) | .30 | .85 | .... |
| Picro-Nigrosin | .25 | .45 | .... |
| Picro-Carmine (Ranvier) | .35 | .65 | .... |
| Picro-Carmine (Weigert) | .30 | .55 | .... |
| Picro-Fuchsin (Van Gieson)..... | .35 | .65 | .... |
| Rubin S. | .45 | .80 | .... |
| Saffranin, alcoholic solution..... | .30 | .60 | .... |
| Saffranin, O. aqueous solution..... | .20 | .40 | .... |
| Saffranin, Aniline (Babe's)..... | .45 | .90 | .... |
| Sudan III..... | .20 | .35 | .... |
| Thionin, alcoholic solution..... | .40 | .80 | .... |
| Toison's Blood Stain..... | .20 | .40 | .... |
| Van Gieson's Stain (Picro-Fuchsin)..... | .35 | .65 | .... |
| Vesuvian Brown | .20 | .40 | .90 |
| Vesuvian Brown (Neisser's) for diphtheria bacilli..... | .25 | .50 | .... |
| Victoria Blue | .20 | .40 | .85 |
| Wright's Blood Stain..... | .40 | .90 | .... |
| Zinc Chloro-iodide | .60 | 1.50 | .... |

Imbedding Material.

| | 1 oz. | 4 oz. | 8 oz. | 16 oz. |
|--|--------|--------|-------|--------|
| Celloidin, Shreds (Schering's)..... | \$1.00 | \$.... | \$. | \$.... |
| Collodion, Thin | .15 | .35 | .50 | .80 |
| Collodion, Thick | .20 | .50 | .75 | 1.25 |
| Collodion, Squibbs, with brush | .25 | .... | .... | .... |
| Collodion, from Schering's Celloidin, Thin..... | .25 | .70 | .95 | 1.50 |
| Collodion, from Schering's Celloidin, Thick..... | .35 | .90 | 1.50 | 2.75 |
| Gelatine, Mass. Kaiser..... | .25 | .65 | 1.10 | .... |
| Paraffine, White, Filtered, M. P. 120°F..... | .... | .... | .... | .30 |
| Paraffine, White, Filtered, M. P. 130°F..... | .... | .... | .... | .35 |
| Paraffine, White, Filtered, M. P. 135°F..... | .... | .... | .... | .40 |
| Paraffine, White, Filtered, M. P. 145°F..... | .... | .... | .... | .50 |
| Pith, Elder, best imported, per package..... | 10c | .... | .... | .... |

Hardening and Fixing Agents.

| | 1 oz. | 4 oz. | 8 oz. | 16 oz. |
|---|--------|--------|--------|--------|
| Acid, Acetic, Glacial..... | \$.... | \$0.25 | \$0.40 | \$0.50 |
| Acid, Acetic, all strengths..... | .... | .... | .... | .... |
| Acid, Acetic, with alcohol (Carnoy)..... | .20 | .50 | .75 | 1.25 |
| Acid, Acetic, with alcohol and chloroform..... | .25 | .65 | 1.00 | .... |
| Acid, Chromic, 1% solution..... | .... | .... | .... | .50 |
| Acid, Chromic, 5% solution..... | .... | .... | .... | .60 |
| Acid, Osmic, Crystal: ¼ gram vial, 75c; ½ gram vial, \$1.25; 1 gram vial, \$2.40..... | .... | .... | .... | .... |
| Acid, Osmic, 2% solution..... | 1.50 | .... | .... | .... |
| Acid, Picric, saturated solution..... | .15 | .35 | .50 | .70 |
| Acid, Picric, with alcohol..... | .20 | .50 | .75 | 1.25 |
| Acid, Picro-Sulphuric (Kleinenberg)..... | .15 | .40 | .65 | 1.00 |
| Albumen Fixative (Mayer)..... | .30 | .85 | .... | .... |
| Corrosive Sublimate, solution, 7%..... | .20 | .50 | .75 | 1.00 |
| Erlicki's Fluid..... | .15 | .40 | .65 | 1.00 |
| Flemming's Solution..... | .30 | .85 | .... | .... |
| Formaline, 40%..... | .... | .... | .... | .40 |
| Formol-Sublimate (Worcester)..... | .20 | .50 | .75 | 1.00 |
| Gilson's Fluid..... | .25 | .75 | .... | .... |
| Hayem's Fixing Solution..... | .25 | .80 | .... | .... |
| Hermann's Fluid..... | .75 | .... | .... | .... |
| Merkel's Fluid..... | .40 | .... | .... | .... |
| Muller's Fluid..... | .... | .... | .... | .40 |
| Ripart and Petit's Fluid..... | .15 | .40 | .65 | 1.00 |

Normal, Dissociating and Decalcifying Solutions.

| | 1 oz. | 4 oz. | 8 oz. | 16 oz. |
|--|--------|--------|--------|--------|
| Acid, Chromic Solution, 1%..... | \$.... | \$.... | \$.... | \$0.50 |
| Acid, Lactic, 10% solution..... | .20 | .45 | .75 | 1.00 |
| Acid, Nitric, 10% solution..... | .... | .... | .... | .40 |
| Acid, Nitric, with alcohol..... | .20 | .45 | .65 | .90 |
| Acid, Picric Solution..... | .... | .... | .... | .40 |
| Alcohol, 30% (Ranvier)..... | .... | .... | .... | .50 |
| Chromo-Nitric Mixture..... | .20 | .45 | .75 | 1.00 |
| Formaldehyde Dissociator (Gage)..... | .15 | .35 | .50 | .70 |
| Hertwig's Osmo-Acetic Solution..... | .35 | 1.00 | .... | .... |
| Kronecker's Fluid..... | .15 | .25 | .40 | .50 |
| Landois' Solution..... | .20 | .40 | .65 | .90 |
| MacCallum's Macerating Fluid..... | .20 | .45 | .75 | 1.00 |
| Normal Saline Solution..... | .... | .... | .25 | .40 |
| Phloroglucin and Nitric Acid Solution..... | .25 | .80 | .... | .... |
| Potassium Bichromate, 0.2% solution..... | .... | .... | .... | .30 |
| Sodium Chloride, 10% solution..... | .... | .... | .25 | .40 |
| Von Ebner's Fluid..... | .20 | .45 | .75 | 1.00 |

Clearing Agents.

| | | | | |
|--|------|------|------|------|
| Acid, Carbolic, 5% solution..... | .... | .... | .... | .45 |
| Acid, Carbolic, 30% solution in Xylol..... | .15 | .35 | .50 | .75 |
| Acid, Carbolic, conc. solution in alcohol..... | .15 | .35 | .50 | .75 |
| Alcohol, Absolute..... | .... | .35 | .50 | .75 |
| Alcohol, all strengths..... | .... | .... | .... | .... |
| Aniline Oil, chem. pure..... | .15 | .40 | .60 | 1.00 |
| Benzole, chem. pure..... | .... | .... | .... | .35 |
| Creosote from Beechwood..... | .15 | .45 | .75 | 1.30 |
| Gage's Mixture (Carbol-Xylol)..... | .20 | .50 | .85 | .... |
| Oil Cajeput..... | .15 | .40 | .60 | 1.00 |
| Oil Cedarwood..... | .10 | .25 | .40 | .60 |
| Oil Cloves..... | .20 | .65 | .95 | 1.60 |
| Oil Lavender, flowers..... | .30 | 1.00 | .... | .... |
| Oil Origanum, Cretian..... | .35 | 1.25 | .... | .... |
| Oil Sandalwood..... | .50 | .... | .... | .... |
| Oil Thyme..... | .25 | .90 | .... | .... |
| Oil Turpentine, rectified..... | .... | .... | .40 | .60 |
| Xylol, pure..... | .... | .... | .... | .50 |

Mounting Material, Cements and Varnishes.

| | 1 oz. | 4 oz. | 8 oz. |
|--|--------|--------|--------|
| Amber Varnish | \$0.25 | \$0.75 | \$.... |
| Apathy's Cement for Glycerine Mounts..... | .35 | 1.20 | .... |
| Asphaltum | .15 | .35 | .50 |
| Asphaltum, Quick Drying..... | .20 | .50 | .75 |
| Bell's Microscopical Cement..... | .65 | .... | .... |
| Brown's Transparent Rubber Cement..... | .35 | 1.00 | .... |
| Brunswick Black | .25 | .45 | .75 |
| Canada Balsam, paper filtered, per 20cc. tin tube.... | .20 | .50 | .80 |
| Canada Balsam, dried..... | .25 | .80 | 1.55 |
| Canada Balsam, dissolved in Absolute Alcohol..... | .30 | .85 | 1.60 |
| Canada Balsam, dissolved in Benzole..... | .30 | .85 | 1.60 |
| Canada Balsam, dissolved in Chloroform..... | .30 | .85 | 1.60 |
| Canada Balsam, dissolved in Xylol..... | .30 | .85 | 1.60 |
| Cedar Oil (Immersion Oil)..... | .25 | .85 | 1.60 |
| Cedar Oil (Immersion Oil), Gruebler's, per 10 gram vial, .20 | .... | .... | .... |
| Colophonium, in Turpentine..... | .15 | .40 | .60 |
| Copal Varnish | .20 | .65 | .... |
| Damar, in Xylol..... | .25 | .70 | 1.25 |
| Damar Varnish | .15 | .45 | .80 |
| Deane's Medium | .30 | .75 | .... |
| Farrant's Medium | .25 | .65 | .... |
| Gelatine Cement | .15 | .50 | .80 |
| Glycerine and Alcohol Mixture..... | .15 | .40 | .65 |
| Glycerine Jelly | .25 | .75 | 1.35 |
| Glycerine Jelly, with Chloral Hydrate..... | .30 | 1.00 | .... |
| Gold Size | .15 | .35 | .60 |
| Gold Size (Gruebler's), per 10 gram vial..... | .15 | .... | .... |
| Levulose, Syrupy | .45 | 1.60 | .... |
| Marine Glue, liquid..... | .25 | .90 | .... |
| Marine Glue, transparent..... | .50 | 1.75 | .... |
| Marine Glue, solid..... | .35 | 1.25 | .... |
| Sandarach Varnish | .20 | .65 | .... |
| Sealing Wax Varnish..... | .15 | .50 | .... |
| Venice Turpentine (prepared for mounting)..... | .15 | .35 | .50 |
| White Shellac Varnish..... | .15 | .40 | .60 |
| White Zinc Cement..... | .40 | 1.00 | .... |

Culture Media Material.

| | 1 oz. | 4 oz. | 8 oz. | 16 oz. |
|---|--------|--------|--------|--------|
| Agar, Agar, Japanese, in shreds..... | \$.... | \$0.35 | \$0.60 | \$1.00 |
| Agar, Agar, Japanese, powd..... | .20 | .60 | 1.00 | 1.75 |
| Beef Extract, Liebig's, 2 oz. jars..... | .50 | 1.10 | .... | .... |
| Gelatine, Gold Label..... | .... | .... | .45 | .75 |
| Gelatine, Silver Label..... | .... | .... | .35 | .60 |
| Gelatine, Copper Label..... | .... | .... | .30 | .50 |
| Gelatine, Granular ..... | .... | .... | .45 | .75 |
| Peptone, from Meat..... | .30 | .85 | 1.50 | 2.50 |
| Peptone, from Albumen..... | .60 | .... | .... | .... |
| Peptone, Witte's | .35 | 1.20 | .... | 4.00 |
| Cotton Wool, for plugging test tubes..... | .... | .... | .... | .25 |
| Cotton, Absorbent | .10 | .20 | .30 | .40 |

Culture Media, Prepared.

Put up in glass tubes, ready for use, sterilized, cotton-plugged and rubber-capped.

- No. 1. **Nutrient Gelatine.**
- No. 2. **Glucose Gelatine.**
- No. 3. **Litmus Gelatine.**
- No. 4. **Nutrient Agar.**
- No. 5. **Glycerine Agar.**
- No. 6. **Glucose Agar.**
- No. 7. **Blood Serum**, according to Dr. Koch.
- No. 8. **Blood Serum**, Loeffler's Mixture for Diphtheria Bacilli.
- No. 11. **Bouillon**, plain.

EMPTY TUBES.

- No. 9. **Empty Tube**, sterilized, cotton-plugged and rubber capped.
- No. 10. **Tube**, with sterilized swab for making throat cultures.

Put up in cases of 12 tubes, any assortment. Kindly specify by number,
the kinds desired. Per case..... .75

Bacteriological Slides.

The following list of slides of the most important disease germs are carried in stock. They are prepared, stained and mounted according to the latest methods in one of our leading laboratories.

- No. 1. **Bacillus of tuberculosis** (in Sputum).
- No. 2. **Bacillus diphtheriae.**
- No. 4. **Diplococcus pneumoniae** (in blood).
- No. 5. **Bacillus coli communis.**
- No. 6. **Bacillus typhosus.**
- No. 7. **Spirillum cholerae Asiaticae.**
- No. 8. **Streptococcus pyogenes** (erysipelas, pseudo-diphtheria, etc.).
- No. 9. **Micrococcus gonorrhoeae** (in pus).
- No. 10. **Staphylococcus pyogenes aureus.**
- No. 11. **Bacillus tetani.**
- No. 12. **Bacillus pestis.**
- No. 13. **Bacillus icteroides.**
- No. 14. **Bacillus anthracis symptomatici.**
- No. 15. **Bacillus anthracis.**
- No. 16. **Bacillus of hog cholera.**
- No. 17. **Bacillus cholerae gallinarum.**
- No. 18. **Bacillus mallei.**
- No. 19. **Bacillus oedematis maligni.**
- No. 20. **Bacillus pyocaneus.**
- No. 21. **Bacillus typhosus** (showing flagella).
- No. 22. **Micrococcus tetragenus.**
- No. 23. **Saccharomyces cerivisceae.**
- No. 24. **Sarcina aurantiaca.**
- No. 25. **Spirillum rubrum.**
- No. 26. **Mucor rhizopodiformia.**
- No. 27. **Bacillus dysenteriae** (Shiga).

Per Slide Net \$ 0.60

BIOLOGICAL APPARATUS IN SETS.

Botany and Zoology are now required for admission to every College and University. A great many High Schools have no laboratory for the study of these sciences, and we therefore give below an equipment sufficient for a **class of twelve pupils**. This list was made out by the High School Examiner of the University of Illinois as being the necessary apparatus with which to start a Biological Laboratory.

BIOLOGICAL SET No. 1.

INDIVIDUAL APPARATUS.

| | | | | | | |
|----|--|----------|-----|--|----------------------|---------|
| 12 | No. 7500. Dissecting Microscopes.. | \$18.00 | | | Brought Forward..... | \$4.68 |
| 12 | 7884. Dissecting Pans, Paraffine bottom | 4.80 | 24 | No. 8062. Dropping Bottles | 4.80 | |
| 12 | 7940. Dissecting Sets | 12.00 | 12 | 8065. Collecting Bottles, No. 2. with corks | .24 | |
| 12 | 5045. Alcohol Lamps, 4 oz..... | 3.24 | 12 | 8065. Collecting Bottles, No. 4. with corks | .35 | |
| 12 | 6925. Biology Tablets, complete | Net 3.36 | 12 | 8102. Syracuse Watch Glasses. | .60 | |
| 12 | 8119. Drawing Pencils, HHHH. | 1.25 | 12 | 4215. Beakers, 1½ oz., No. OO. | .96 | |
| 12 | 8015. Germinating Boxes | 6.60 | 24 | 5397. Test Tubes, assorted..... | .52 | |
| 12 | 8128. Jelly Tumblers, with covers | .55 | 72 | 5395. Test Tubes, 4x½..... | 1.00 | |
| | (Stender Dishes are better, and may be substituted for above.) | | 12 | 4599. Test Tube Brushes..... | .40 | |
| 24 | 2102. Tumblers, large size..... | 1.20 | 144 | 4776. Assorted Corks | .65 | |
| 12 | 8091. Lightning Jars, pint..... | 1.50 | 24 | 5213. Rubber Stoppers, assorted, 1 and 2 hole..... | 1.20 | |
| 12 | 8091. Lightning Jars, quart..... | 1.65 | | | | |
| | | <hr/> | | | | |
| | | \$50.79 | | | Total | \$64.87 |

GENERAL APPARATUS TO BE USED JOINTLY BY TWO OR MORE PUPILS.

| | | | | | | |
|----|---|--------|---|--|----------------------|---------|
| 1 | Nest. No. 4229. Beakers, No. 1-4..... | \$0.71 | | | Brought Forward..... | \$50.79 |
| 1 | 4791. Cork Press | .25 | 2 | Pkgs. 4881. Filter Paper, 8 in..... | .66 | |
| 1 | Set. 4781. Cork Boreers, 1-6..... | 1.00 | 6 | 4926. Funnel Tubes | .60 | |
| 1 | Lb. 4981. Glass Tubing, ¼ inch. | .44 | 6 | 1525. Chemical Thermometers | 2.40 | |
| 12 | Ft. 5215. Rubber Tubing, ¼ in. | 1.32 | 3 | 5001. Graduated Cylinders, 100cc. | 1.95 | |
| 1 | 5073. Porcelain Mortar, 3¼ inch | .42 | 1 | 3830. Cenco Trip Balance... | 6.65 | |
| 1 | 4921. Funnel, 2 inch..... | .08 | 1 | Set 3933. Iron Weights, 1 Kilo to 5g. | 1.20 | |
| 1 | 4921. Funnel, 4 inch..... | .16 | 6 | 8088. Battery Jars, quart... | 1.50 | |
| 2 | Pkgs. No. 4881. Filter Paper, 4 in..... | .24 | 6 | 8088. Battery Jars, gallon... | 3.30 | |
| | | <hr/> | 3 | 5329. Ring Stands, 3 ring... | 1.80 | |
| | | \$4.68 | | | Total | \$24.74 |

CHEMICALS.

| | | | | | | |
|--------|--|--------|-----|--|-----------------------|---------|
| 10 | grams Iodine Crystals, in bottle.... | \$0.20 | | | Brought Forward | \$3.50 |
| 25 | grams Potassium Iodide, in bottle.. | .40 | 1 | gallon Ethyl Alcohol, in can..... | 3.45 | |
| 250 | grams Ether, in can..... | .30 | 1 | gallon Methyl (Wood) Alcohol, in can | 1.00 | |
| 125cc. | Nitric Acid, in reagent bottle.... | .25 | 100 | grams Absolute Alcohol, in bottle.. | .35 | |
| 125cc. | Sulphuric Acid, in reagent bottle | .25 | 250 | grams Potassium Hydrate, sticks, in bottle | .25 | |
| 125cc. | Hydrochloric Acid, in reagent bottle | .25 | 250 | grams Potassium Chlorate, in bottle | .10 | |
| 125cc. | Ammonium Hydrate, in reagent bottle | .25 | ½ | gallon Formaline, 40%, in bottle.... | 1.35 | |
| 500 | grams Mercury, in bottle..... | 1.10 | 50 | grams Glycerine, pure, in bottle.... | .15 | |
| 100cc. | Eosin Solution, in bottle..... | .50 | 50 | grams Chloroform, in bottle..... | .20 | |
| | | <hr/> | | | | |
| | | \$3.50 | | | Total | \$10.35 |

(Continued next page.)

BIOLOGICAL SET No. 1—Continued.**Microscopical Apparatus.**

| | | | | | | |
|----------|--|-------|---------|---|-------|---------|
| 1 | No. 70B. Spencer Microscope. | Net. | \$28.35 | Brought Forward | ..... | \$31.30 |
| 72 | 7718. Glass Slips | ..... | .50 | 25 grams Corrosive Sublimate | ..... | .25 |
| 1 oz. | 7736. Cover Glasses, No. 2, $\frac{1}{4}$ inch | ..... | .90 | 100 grams Picro Sulphuric Acid, in G. S. B. | ..... | .80 |
| 3 | 7722. Culture Slides | ..... | .15 | 1 tube Canada Balsam | ..... | .20 |
| 1 | 7894. Section Razor | ..... | .85 | 25cc Haematoxylin (Delafield's) | ..... | .25 |
| 1 | Cake Paraffine, soft | ..... | .15 | 25cc Borax Carmine (Grenacher's) | ..... | .25 |
| 1 | Cake Paraffine, hard | ..... | .20 | 25cc Picro Carmine | ..... | .35 |
| 25 grams | Chromic Acid, cryst., in bottle | ..... | .20 | 10 grams Methyl Green (dry) | ..... | .45 |
| | | | | 250 grams Xylol, in bottle | ..... | .30 |
| | | | \$31.30 | Total | ..... | \$34.15 |

Auxiliary Apparatus.

The following are convenient but not indispensable.

| | | | | | | |
|---|--|---------|----|---|----------------------|---------|
| 1 | No. 8090. Aquarium, 5 gal..... | \$ 3.30 | | | Brought Forward..... | \$12.05 |
| 1 | 7706. Microtome..... | 6.00 | 1 | No. 5001. Graduated Cylinder, 100cc | 2.20 | |
| | (For other Microtomes see pages 26-28.) | | 6 | 1331. Bell Jars, low form, 6 in.. | 5.40 | |
| 1 | 1359. Bell Jar, for covering microscope..... | 1.65 | 1 | 7928. Syringe and Canula..... | 1.50 | |
| 1 | 1533. Chemical Thermometer, 200° C. | 1.10 | 25 | Mounted Botanical Specimens, assorted, in case. | | |
| | | | | | Net. | 7.50 |
| | | | | | (See page 67.) | |
| | | \$12.05 | | Total | | \$28.65 |

The School should also provide a few reference books. Every teacher should have Ganong's "The Teaching Botanist," which contains much valuable information.

SUMMARY.

| | | |
|-------------------------|-------|----------|
| Individual Apparatus | ..... | \$ 64.87 |
| General Apparatus | ..... | 24.74 |
| Chemicals | ..... | 10.35 |
| Microscopical Apparatus | ..... | 34.15 |
| Auxiliary Apparatus | ..... | 28.65 |

| | | |
|-----------------------------|-------|----------|
| | | \$162.76 |
| Boxing, packing and drayage | ..... | 3.00 |

Total.....\$165.76

Price, Complete as above, F. O. B. Chicago, \$155.00.

BIOLOGICAL SET No. 2.

If it is impossible to complete the equipment the first year it is suggested that the School Board appropriate one hundred dollars the first year, and add to the equipment as often as possible until the laboratory is completely furnished. The hundred dollars may well be expended as follows:

1 Outfit of Individual Apparatus from Set No. 1.....\$64.87
Omitting the following:

| | | | |
|----|------------------------------|-------|---------|
| 12 | No. 7884. Dissecting Pans | ..... | \$4.80 |
| 12 | 8015. Germinating Boxes | ..... | 6.60 |
| 12 | 8128. Jelly Tumblers | ..... | .55 |
| 24 | 2102. Tumblers | ..... | 1.20 |
| 12 | 8091. Lightning Jars, pint. | ..... | 1.50 |
| 12 | 8091. Lightning Jars, quart. | ..... | 1.65 |
| | | | \$16.30 |

Note.—Any available dish may be used in place of the Dissecting Pan. Chalk Boxes make a good substitute for Germinating Boxes.

General Apparatus of Set No. 1.....\$24.74
Omitting the Beakers, Cork Press, Cork Boreers, Mortar, 4 inch Funnel, 8 inch Filter and 3 Chemical Thermometers.....4.45

Chemicals of Set No. 1.....\$20.29
Omitting the following:.....\$11.50

| | | | |
|--------|------------------------|-------|---------|
| 500 | grams Mercury | ..... | \$1.10 |
| 100cc. | Eosine Solution | ..... | .50 |
| 1 | gallon Ethyl Alcohol | ..... | 3.45 |
| 1 | gallon Methyl Alcohol | ..... | 1.00 |
| 100 | grams Absolute Alcohol | ..... | .35 |
| | | | \$ 6.40 |

Microscopical Apparatus of Set No. 1.....\$5.10
Boxing, Packing and Drayage.....1.50

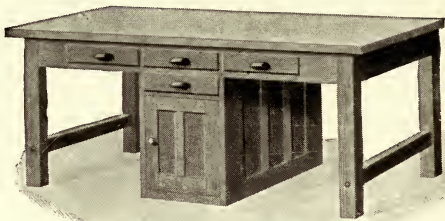
Total.....\$109.61

Price, Complete as above, F. O. B. Chicago, \$100.00.

LABORATORY TABLES.



No. 250.

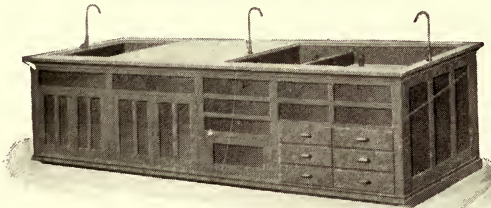


No. 245.

These tables were designed by Prof. Otis W. Caldwell, University of Chicago, and have proven to be well proportioned for laboratory work.

Hardwood is used throughout and the top is made of narrow birch strips, matched and glued. These tops will not warp or crack. Top is oiled and body is varnished, antique unless otherwise specified. The size is same for all tables, 6 feet long by 3 1/2 feet wide by 2 1/2 feet high. Prices are F. O. B. Factory:

| | | |
|--------|--|----------|
| 250. | Table, with four drawers, no locks..... | \$ 22.00 |
| 252. | Table, like No. 250, but with six drawers, no locks..... | 23.50 |
| 254. | Table, like No. 250, but without drawers..... | 19.00 |
| 245. | Table, with eight drawers and 2 cabinets, no locks..... | 36.25 |
| 248. | Table, like No. 245, except that the cabinets are displaced by drawers, making sixteen drawers in all..... | 39.75 |
| Extra; | Masterkeyed Locks, per drawer..... | .50 |
| Extra; | Tops finished black acid proof in place of oil, per top..... | 1.00 |



No. 257.



No. 256.

INSTRUCTORS' DESKS.

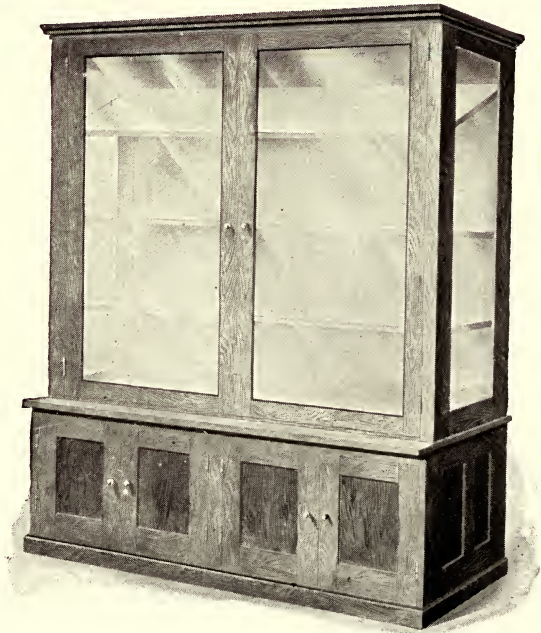
| | | |
|------|--|--------|
| 257. | Instructors' Desk, practical and convenient. It has been installed where only the best is acceptable. The three lead lined troughs are provided with vertical overflows and desk is completely provided with gas and water fixtures with pipes to the floor. Table measures 13 ft. by 3 ft. by 3 ft. high. Nine locks, all alike, provided. Made of oak, rubbed antique finish, unless otherwise specified. ....F. O. B. Factory | 240.00 |
| 256. | Instructors' Desk, with aquarium 16 in. by 29 1/2 in. by 16 3/4 in. deep inside. The desk is provided with Alberene stone sink and complete plumbing for water and gas. Desk measures 9 1/2 ft. by 3 ft. by 34 in. high. Made of oak, rubbed antique finish. Locks on all drawers and cupboards.....F. O. B. Factory | 188.50 |



No. 278.

278. **Germinating Bed.** This piece of furniture is the result of numerous inquiries from high schools for an inexpensive, water-tight box for the purpose of planting specimens and watching the development of plant life. It is a valuable addition to every institution where botany is taught. It can be divided into a number of compartments with pieces of lumber, or metal. Made of oak, lined inside with heavy sheet lead and mounted on six roller-bearing casters. Bed is 22 inches wide, 94 inches long and $4\frac{1}{2}$ inches deep inside at the ends. It pitches toward the center where it is 5 inches deep. The drain in the center consists of a close brass screen, flush with the bottom and connected to a galvanized iron funnel.....F. O. B. Factory \$ 43.00

260. **Museum Cabinet.** This cabinet is designed for the display of specimens of plants, shells, bird's eggs, barks, woods, mineral and geological specimens. Every school should have its museum where the collections made by students may be kept in a permanent and instructive form. Made of oak, 60 inches wide by 74 inches high; lower part 17 inches deep. Furnished with three adjustable shelves. The top one on an angle, with retaining rim on front edge. Flat key locks, all alike, on upper and lower doors. F. O. B. Factory. 55.00



No. 260.

TEXT BOOKS, MANUALS AND REFERENCE BOOKS.

Recommended for teachers of Botany and Zoology.

| | Net Price. |
|---|------------|
| Andrews' "Botany all the Year Round" | \$ 1.00 |
| Bailey's "Beginners' Botany" | .60 |
| Bailey's "Botany"; an elementary Text Book | 1.10 |
| Bausch's "Manipulation of the Microscope" | 1.00 |
| Bergen's "Elements of Botany," with Key and Flora for Northern and Central States (Revised Ed.) | 1.20 |
| Bergen's "Foundations of Botany" with Key and Flora as above | 1.70 |
| Bergen's "Note Book" to accompany above | .90 |
| Bergen's "Essentials of Botany" | 1.20 |
| Boyer's "Laboratory Manual in Elementary Biology" | .90 |
| Caldwell's "Laboratory Manual of Botany" | .50 |
| Caldwell's "Plant Morphology" | 1.00 |
| Campbell's "University Text Book of Botany" | 4.00 |
| Campbell's "Structure and Development of Mosses and Ferns" | 4.50 |
| Carpenter & Dallinger's "The Microscope and its Revelations" | 8.00 |
| Chamberlain's "Plant Histology," for slide preparation, etc. | 2.25 |
| Clark's "Laboratory Manual in Practical Botany" | 1.00 |
| Cole's "Manual of Biological Projection and Anesthesia of Animals" | 1.50 |
| Colton's "Zoology, Descriptive and Practical" | 1.50 |
| Colton's "Elementary Course in Practical Zoology" | .65 |
| Comstock's "Insect Life"; Teachers' and Students' edition | 1.75 |
| Cook's "Ponds and Ditches" | .85 |
| Coulter's "Plant Relations" | 1.10 |
| Coulter and Others, "Text Book of Botany for Colleges and Universities" .. | 2.00 |
| Crary's "Text Book of Field Zoology" | 1.25 |
| Darwin's "Elements of Botany" | 1.25 |
| Davenport's "Introduction to Zoology" | 1.15 |
| Davenport's "Elements of Zoology" | 1.25 |
| Davies' "The Preparation and Mounting of Microscopic Objects" | 1.25 |
| Dodge's "General Zoology" | 1.80 |
| Dodge's "Introduction to Elementary Practical Biology" | 1.80 |
| Furneaux's "Field and Woodland Plants" | 1.50 |
| Gage's "The Microscope"; Introduction to Microscopic Methods and Histology | 2.00 |
| Galloway's "Text Book of Elementary Zoology" | 1.25 |
| Ganong's "The Teaching Botanist" | 1.25 |
| Gray's "Structural Botany" | 2.00 |
| Gray's "Lessons in Botany" | 1.60 |
| Gray's "Lessons in Botany and Manual" (Revised) | 2.15 |
| Guyer's "Animal Micrology," for slide preparation in animal histology .. | 1.75 |
| Hertwig's "General Principles of Zoology" | 1.75 |
| Huxley and Martin's "Course of Elementary Instruction in Practical Biology" | 2.60 |
| Lindsay's "Introduction to the Study of Zoology" | 1.65 |
| Marks and Moody's "Little Busybodies": Life of Crickets, Ants, Bees, Bee- tles and other insects | .75 |
| Merrill's "Studies in Zoology" | .80 |
| Needham's "Lessons in Zoology" | .90 |
| Needham's "Outdoor Studies" | .40 |
| Nelson's "Herbarium and Plant Description" | .75 |
| Newell's "Outlines of Lessons in Botany"; Part I. "From Seed to Leaf," 50c Part II. "Flower and Fruit" | .80 |
| Orton's "Comparative Zoology" | 1.80 |
| Osterhout's "Experiments with Plants" | 1.25 |
| Packard's "Guide to the Study of Insects" (9th edition) | 5.00 |
| Parker & Haswell's "Text Book of Zoology"; 2 vols. | 10.00 |
| Parker & Haswell's "Manual of Zoology" (revised Ed.) | 1.60 |
| Pepoon, Mitchell & Maxwell's "Studies in Plant Life" | .60 |
| Pratt's "Invertebrate Zoology" | 1.25 |
| Setchell's "Laboratory Practice for Beginners in Botany" | .90 |
| Sedgwick & Wilson's "General Biology"; An introduction to practical and Theoretical Biology | 1.75 |
| Shipley & MacBride's "Zoology"; An Elementary Text Book | 3.00 |
| Smith's "Our Insect Friends and Enemies" | 1.50 |
| Spaulding's "Introduction to Botany"; A Study of Plant Life in a Practical and Philosophical way. A Laboratory Guide | .80 |
| Strasburger's "Handbook of Practical Botany" | 2.50 |
| Strasburger, Noll & Others' "Text Book of Botany" | 5.00 |
| Stevens' "Plant Anatomy" | 2.00 |
| Stevens' "Introduction to Botany," with Key and Flora | 1.50 |
| Walton's "Practical Guide to Wild Flowers and Fruits" | 1.50 |
| Zimmerman's "Botanical Micro Technique"; A Handbook of Preparing, Staining, Investigating, Etc. | 2.50 |

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